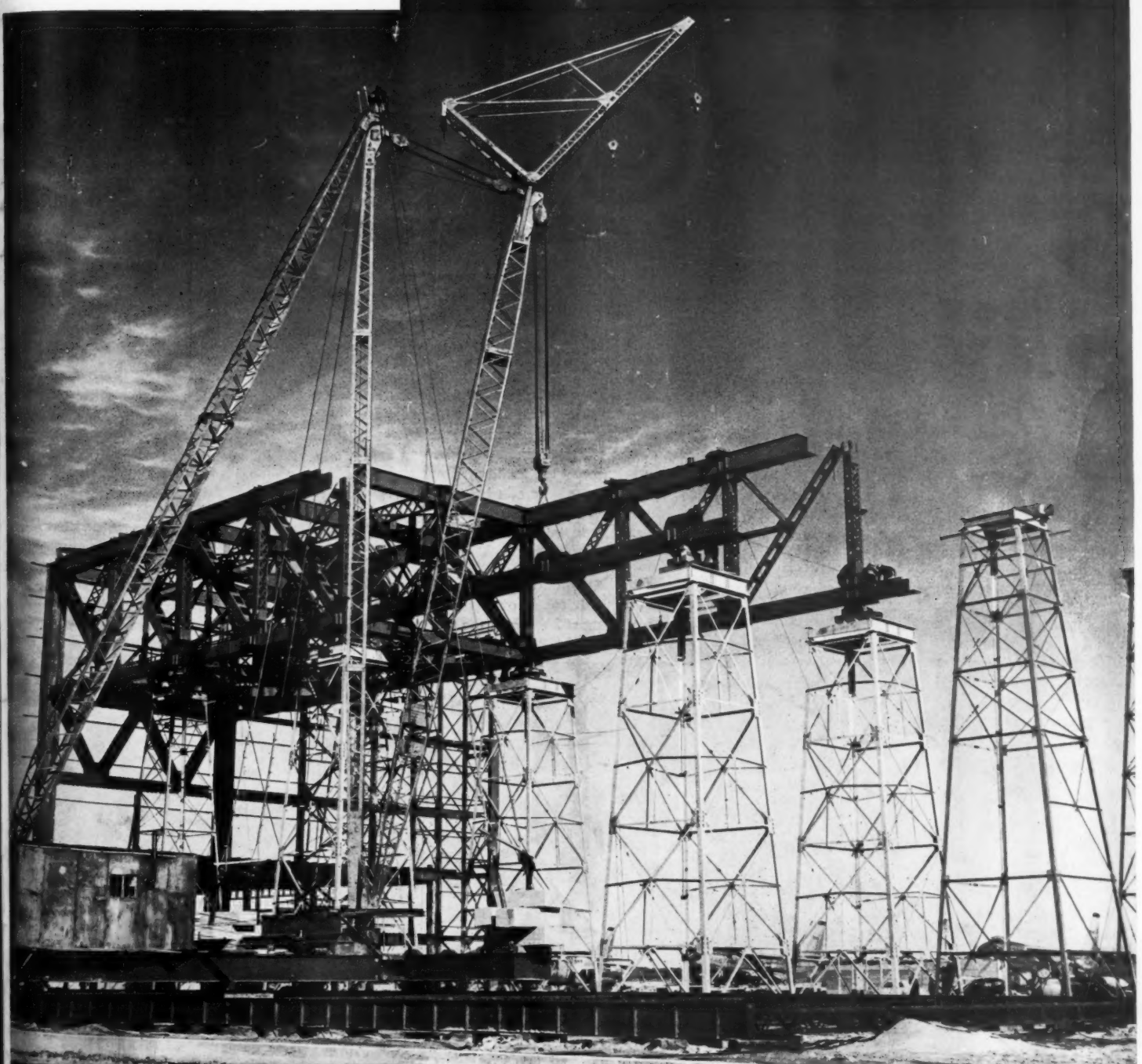


620



contractors and engineers monthly

DECEMBER 1952



Huge traveler with 110-foot mast, 100-foot boom, and 35-foot jib sets main truss members on new Boeing Flight Hangar in Wichita, Kansas.

Story on page 43

The rapidly easing steel-supply situation is keeping the National Production Authority busy considering changes in both regulations and effective dates. Richard McDonald, NPA Administrator, announced early in October that increased amounts of controlled materials self-authorized for commercial and most other types of construction would be available beginning May 1, 1953. But several agencies were quick to declare that the date could be moved up.

In terms of **actual tons of steel**, the May 1 order means that highways will receive 25 tons of carbon steel per project, not to include more than 12 tons of structural. The present limit is 25 tons, not to include more than 2 tons of structural. Quotas on commercial, public, school, and similar types of construction will also be raised, and the ban on recreational construction lifted.

The order did not meet with AISC approval, and they called upon the Government to remove all controls on building construction, and particularly those imposed by CMP Regulation 6. Even more vehement was the plea of the U. S. Chamber of Commerce which demanded **immediate relaxation of controls** during the balance of 1952 and the suspension of controls on January 1, 1953. Along the same line, a task group of the Construction Industry Advisory Committee recommended that in view of the optimistic steel picture, the May 1 order be moved up to January 1. The NPA agreed to take this recommendation under consideration.

Despite the dampening effect of controls, the **construction boom continues**. For the first 10 months of this year, new construction expenditures totaled \$27,025 million, 4 per cent over the amount for the same 1951 period. The forecasters see no possibility of a slackening off until well into 1953, and they emphasize that slackening off does not mean recession.

Concerning heavy-construction machinery, the 1953 outlook is the best in years. Production and demand will probably be in better balance than at any time since 1950. The approximately 500 companies composing the industry will have an aggregate production in excess of \$3 billion. Grader blades, power shovels, and track-type tractors are still on the scarce list, but new facilities, plus a lessening in parts demand, is expected to ease this situation somewhat.

In addition to the expected \$68 billion's worth of new construction to start in the U. S. next year, foreign countries will also affect the demand for heavy equipment. Shipments to Latin Amer-

NEWS AND VIEWS

of the construction industry—steel, turnpikes, shortage of engineers



James Shocknessy, Chairman of the Ohio Turnpike Commission, wields a shovel at ground-breaking ceremonies.

ica alone totaled almost \$100 million for the first 6 months of this year. If the rate continues, the annual total will exceed 1951's record of \$173 million. And Brazil alone bought 632 tractor-dozers in 1951.

One reason for the expected demand of equipment is the prospect of **more and more highway work**, especially of the toll-road variety. New or broadened authority for the construction and financing of toll roads will be introduced in the legislatures of at least a score of states during 1953. About 30 states are in at least one phase of toll-road development. New Jersey election returns showed that General Eisenhower's huge plurality was meager compared to the overwhelming approval given the referendum on the Garden State Parkway toll facility. The proposal puts the State's faith and credit behind the \$285 million bond issue, formulated to save the taxpayers \$80 million in interest.

The State's sister toll road, the 118-mile **New Jersey Turnpike is still chalking up new records**. Over 18 million vehicles are expected to use the road this year, almost 2½ times the original estimate. The average daily traffic is about 50,000 vehicles. This increased volume forced officials to raise the 1952 budget 28 per cent to provide revenue for needed expansion.

Despite the record-breaking vehicle counts, the Turnpike had a **better safety record** in relation to state highways. In the first 10 months of operation, there were 85.7 accidents per 100 million vehicular miles. This figure is considerably lower than the 381 per 100 million vehicular miles for all state facilities and the 484 on parallel highways. The fatality rate was 5.52 per 100 million miles of travel, against 5.7 on all New Jersey highways, 6.0 on the parallel facilities, 7.7 on all national highways, and 7.4 on the Pennsylvania Turnpike.

To reduce accidents further, the Authority is rehabilitating the entire 118 miles of shoulders with a surface treatment of light-colored stone chips which contrast with the darker pavement. The Pennsylvania Turnpike has added a white reflectorized, 6-inch curb line to the left of the inside lane adjacent to the grass center strip. Both turnpikes have added more patrol cars and also issued slow-down warnings to transportation companies.

Speaking of records, just about all the country's bridges are destined to drop back a notch in rank when Michigan starts work next spring on its **new suspension span across the Straits of Mackinac**. Exceeded only by the famous Golden Gate Bridge, the proposed \$95 million structure will have a suspension span of 3,800 feet. Towers will be 565 feet high and will be sunk to a depth of 140 and 100 feet. The 54-foot-wide deck will carry 4 lanes of traffic.

But plans will always be just plans unless we have enough engineers coming along to fill the ranks of the nation's Number One industry. With pressure increasing on draft boards to discontinue the deferment of students, there is real danger that we may repeat the mistakes made in the past two wars. The Engineering Manpower Commission of the Engineers Joint Council points out that a man may render just as valuable a service to his country out of uniform as in uniform. The **critical shortage of engineers** and scientists demands that more attention be given to proper allocation of these skills.



Workmen pour steam into permafrost to thaw out the site of a power plant in the Fairbanks, Alaska, area. Construction is directed by the Corps of Engineers.



The last of six 40-foot-long beams is set in Indiana's first prestressed-concrete bridge. The 11-ton units were laid and ready for traffic in less than 3 hours.

Covering the Field

Accounting

Modern office methods reduce a contractor's working time and increase his efficiency. Mechanization does it. Page 54.

Airports

The Navy extends a runway for jet testing at Patuxent Air Station and builds a hydraulic catapult. Story on page 28. A control tower was moved bodily to a safer spot. Raised by air jacks, it traveled on truck-drawn dollies. See page 48.

Book Reviews

Cleveland Rodgers' biography of Robert Moses, New York City Park Commissioner, is reviewed on page 20. News of a legal guide book for contractors and engineers appears on page 27.

Bridge

A viaduct bridges a 35-track railroad yard in Kansas. Keeping an eye on the train schedules during construction was a major problem. Turn to page 10.

Buildings

Hospital-foundation work was speeded by a tractor-mounted trencher. Page 41. A huge hangar for Stratojets is the latest at an Air Force plant. Cranes and a traveler erected the umbrella-like structure. Photo, page 1; story, pix, page 43. A single-level school gets an addition. It was low-cost construction. See page 71.

Canals

A ditcher that grades and excavates in one operation eliminated much hand labor on a canal job. Page 13.

Conventions

Calendar, page 67. A paper read at an ASCE meeting discussed the effect of design on construction costs. Page 68.

Dam

The builders of Lexington Dam, Calif., had to race the winter rains. Words and pix tell the story of this huge earth-fill barrier. See page 58.

Distributor Doings

The regular dealers' department starts on page 85 with an account of AED Region II's fall conference.

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Highways

High-type patching makes for long-lasting smooth repairs. A Texas distributor maintenance engineer tells how. Page 14. More maintenance, this time on shoulder stabilization, is described on page 32.

Some news about a county good-roads program is to be found on page 33.

Grading to eliminate highway curves meant a 3-mile relocation through a rocky hill. The going was tough. Page 51.

State prepares for snow. Men and equipment stand by in Connecticut. Page 66.

Page 74 tells what Colorado is doing about public relations.

Law

Don't get entangled with red tape. Turn to page 78 and "Avoid Legal Pitfalls".

Letters to the Editor

State gasoline taxes—a correspondent's clarification appears on page 8.

Do traffic circles relieve congestion, or are expressways the right answer? Discussion on page 9.

News and Views

Steel controls are easing and construction is booming. For a general survey of highway and other work, see page 2.

Paving

Concrete pavement and median added to make divided highway. Story, pix, page 22. It's bituminous paving for New Mexico. Story of a sample road on page 81.

Safety

Use a salamander? Better read page 18.

Tunnel

Building one for a railroad to a mine in squeezing ground. Pix, story, page 4.

Welding

More welds in design. See page 38.

Asphalt plays leading role on

Boston-Fall River Expressway

Laying hot-mix Texaco Asphaltic Concrete wearing surface over a Texaco Asphalt Macadam foundation on 3½-mile section of Boston-Fall River Expressway. Contractor: Campanella and Cardi Construction Company, Hills-grove, R. I.



How this Massachusetts super-highway project looked in April 1951 (top) and in August 1951, when it was ready for the asphalt pavement.

In constructing this 3½-mile section of its new Boston-Fall River Expressway, Massachusetts employed resilient, heavy-duty Asphalt construction exclusively.

For the two 24-foot lanes of this dual highway, Asphalt types were selected for both the foundation and the wearing surface. Texaco Asphalt Macadam, constructed by the penetration method, serves as foundation. Hot-mix Texaco Asphaltic Concrete was laid as a wearing surface. Texaco Asphalt Macadam also was constructed as a surface for the superhighway's 10-foot shoulders.

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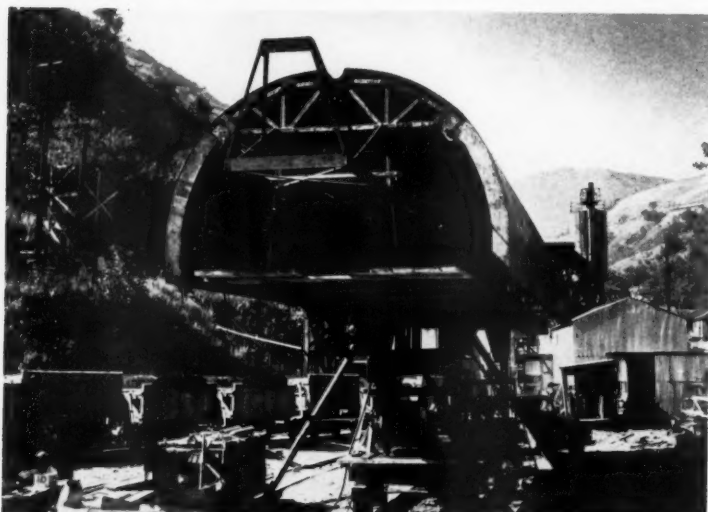
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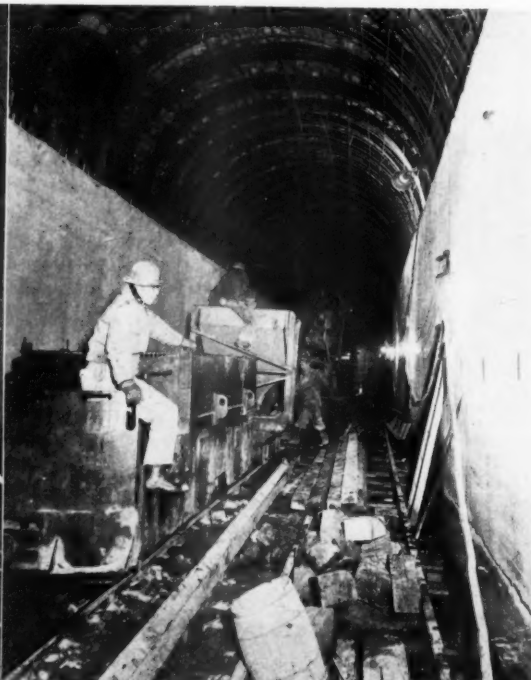
The bench has been blasted out as holing-in begins. The jumbo on the left has 3 stationary platforms mounting 8 Gardner-Denver drills on Cleveland power booms.



Here is the 78-foot steel arch form. In normal operations it was mounted on a 3-foot-gage track on the tunnel center line; at one location it was set on the drill jumbo.



This wall form consists of steel panels with plywood facing. They are mounted on a jumbo with 11½ feet of clearance.



Concrete enters the wall form from a train of 2-yard shop-built hoppers which dump into a conveyor at the foot of the jumbo.

Squeezing Ground
Hampers Drilling on . . .

Tricky Utah Tunnel Job

By RAY DAY

• AT Bingham Canyon, Utah, where Kennecott Copper Corp. is taking 100,000 tons of ore a day from the biggest open-pit mine on earth, The Utah Construction Co. of Salt Lake City is finishing one of the most interesting railroad tunnels built in the west. For the General Superintendent and builder, Paul Guinn—widely known throughout the west as "The Bunyan" of tunnel fame (see C. & E. M., Nov., 1952, pg. 95)—this was his 60th heading. And, like the preceding 59, it was finished without loss of life underground.

With Project Engineer Charles Hageman designing all the special equipment needed for the job, Guinn and a hard-bitten crew of construction stiffs set two apparent world records in driving the 7,042-foot 18 x 25 horseshoe bore. During the month of March, 1952, they went forward 803 feet for what is believed to be the best hard-rock footage ever made. In other sections of the tunnel, particularly through 2,000 feet of ground so tricky and soft it had to be advanced without powder—with breastboards, crown bars, spiling, and clay spades—progress dropped down to 4 feet a day. That is believed to be another world record, in reverse.

Scheduled for 1952 completion, the job was six months behind in September, so tough had the difficult parts been. Guinn was under a doctor's care with orders to cut out Copenhagen, alcohol, and fat meat. That turn of events for a man like Guinn describes about as well as anything how deceptively tough an easy-looking job can be.

Tunnel Needed For Hauling

Kennecott Copper Corp. is using a system of several railroad tunnels, as the Bingham Canyon open pit progresses, to reduce the cost of hauling ore from the mine. The level at elevation 6,040 was tapped by a similar tunnel, and the present one just built by

The Utah Construction Co. is at elevation 5,840. Its south-portal location was about 50 feet below the floor of the pit when the job was visited, but it will be uncovered by March, 1953. Later on, as the pit gets deeper, another tunnel will be built about 200 feet lower than the one just finished. These tunnels will permit ore trains to make a much easier haul downgrade over the loading benches, through the tunnels, and on out to the main railroad line heading toward the Magna smelter.

Since the west-portal location was still below the floor of the pit when the tunnel was finished, it had to be a single-heading operation from start to finish. The mountain pierced by the tunnel is a badly faulted hill of quartzite with lime intrusions, porphyry, and some ground so soft the miners dared not use powder on it. Every foot of the tunnel had to be protected with lagging set behind steel or timber supports, and about 550 feet had to be concreted during construction. Steel and timber wouldn't hold the squeezing ground.

The tunnel has a drainage grade of 0.3 per cent. Its sides and roof arch will be protected by a reinforced-concrete lining averaging 1 foot thick. The tunnel bottom will carry a standard-gauge railroad track.

Tunnel Excavation

Face-off work started in late November, 1950, and by January of 1951 the miners were ready to start underground. At that time, it was believed that a considerable part of the bore could be built through hard rock without tunnel supports. A fancy 85-hole pattern for blasting had even been set up, and miners were thinking in terms of 6 and 8-foot rounds. They used the 85-hole pattern only through the good run in March, 1952, and even so, rounds were seldom longer than 4 feet.

Credit for the relative over-all speed, despite the bad ground, can be laid to the organization of the work and the design of fine equipment for this job. The job headquarters were set up on the east edge of Bingham. In addition to a big main yard where steel supports and timber could be stored, two 1,350-cfm Sullivan 2-stage compressors, driven by GE 300-hp motors, were installed to furnish air. A Sutorbilt 22 x 60 fan, driven by a 150-hp motor was also set in to pull smoke from the tunnel. The air line venting the tunnel was 22 inches in diameter.

As a part of the supply end of the project organization, Utah Construction worked with District Manager P. E. Moss of Goodall Rubber Co.'s Salt Lake City branch office to standardize on Goodall rubber products for the entire job. Air hose, water hose, concrete-placing hose, raincoats and boots, and even the conveyor belts for the big Conway No. 100 mucker were furnished by Goodall. Some of the mucker belts, particularly in good dry formations, were destined to handle as much as 35,000 cubic yards of tunnel excavation without replacement. Even the big-diameter bull hose from the main air header to the drill jumbo was made by Goodall.

Another important part of the early planning for the tunnel expressed itself in the form of a special drill jumbo which every miner on the job came to

like better than any he had ever seen. The jumbo was mounted on special double-flange wheels, which in turn were set in full oscillating trucks under the jumbo carriage. These special trucks were so efficient that the jumbo never jumped a track.

The jumbo was a heavy structural-steel affair, with bolted connections, built without wings. Its three front platforms were stationary, and the rear end was used for a "cherry picker" or hoist which handled bracing, tunnel supplies, and raised empty cars during the mucking-out phase of a round. Eight Gardner-Denver drills were used. They were mounted on Cleveland power booms, which stood up exceptionally well and permitted wide flexibility of movement of the drills, particularly in this ground where varying formations could change drill patterns from one round to another.

The jumbo feature of particular pleasure to the miners was a stationary stairway arrangement, instead of the conventional ladders, which made it easy for the men to get from one platform to another if they were carrying equipment and supplies. This stairway was fully protected by a guardrail so the men would not fall. Guinn has never had a man killed underground on any of his tunnels, but he is just as careful about less serious injuries.

The jumbo was also equipped with a 15-hp electric traveling motor and its own light system. Electricity came into the tunnel at 2,300 volts, was stepped down to 440 at a transformer bank, was used at 440 on this motor, and a smaller transformer on the jumbo stepped the current down to 110 for lights. A 200-foot cord permitted the jumbo to travel under its own power, and the machine also had a special drawbar connection so it could be moved by one of the locomotives.

The jumbo was so arranged that it could be easily loaded with all drilling supplies for a round, with steel and timber bracing, lagging, and so on. When it moved into the heading after mucking was finished, everything was in position.

A typical round—and these were none too numerous—started when the jumbo moved into the tunnel face. Guinn considered it too dangerous for drillers at ground level to work while drilling was under way on the upper platforms, so two men worked from the ground and sank the lifter holes for the next shot while miners above placed the bracing and lagging to protect the last round. By the time they had finished installing this material, the lower drillers were done with their work. The steel support pieces were 6, 8, and 10 inches in size and came in four sections: two legs and two arch sections. They could be quickly bolted together.

Two types of drill bits were used: Timken tungsten-carbide for the hard rock, and Timken throwaways for the shale and softer material. The tungsten-carbide bits were sharpened on the job. Holes followed the conventional tunnel pattern of breakouts, arch, rib, relievers, and lifters, and the pattern was modified as the formations changed. Hercules 1¼-inch powder was used, with delays from 0 to 10. The final powder ratio was only 1.85 pounds per cubic yard of rock excavation. The holes were exploded from the 440-volt electric-power supply line. Total time for drilling and shooting in favorable material was only 1½ hours.

Broken rock was mucked out by a Conway No. 100 mucker, loading three strings of 8 cars each. The cars were 8-yard Westerns, and were pulled by Goodwin 15-ton locomotives, each machine carrying six 29-plate, 54-cell Gould batteries. The mucked-out material was dumped in a waste area located 4,500 feet from the portal—so great a distance that a diesel locomotive was used outside. A conven-



Utah Construction Co. Photo

The grand old man of tunneling, Paul "The Bunyan" Guinn, began his career before Boulder Dam. This makes No. 60. He's shown at the right with some of his miners.

tional loading system was used, the locomotive backing in with its string of empties. As it backed in under the drill jumbo, about 200 feet from the face, an empty car was picked up by the hoist on the jumbo. The locomotive then went in and picked up a loaded car from the mucker, ran out beyond the

jumbo, and backed the empty in to the mucking machine. This process was repeated until the locomotive had a full string of loaded cars.

The Conway mucker was operated in such a way that the belt was loaded with rock at all times. The belt carried just enough rock to load one of the

cars, and was started up from its loaded position. In spite of this, exceptional belt life was reported by Guinn.

Soft Ground Causes Trouble

Miners who were accustomed in good going to a normal round time of 3½ hours whistled in amazement when the first bad ground was hit. In fact, they had been moving so fast that they punched a hole 160 feet through this squeezing ground before it started shoving. Then suddenly the hill began to move, and railroad tracks soon became bent and twisted.

The section had been protected with heavy steel supports on 5-foot centers when the tunnel was drilled at that point, and solid lagging was in place. The first thing Guinn did, and he ordered it immediately, was a doubling of steel. Still the ground moved. Guinn broke off operations at the heading and the crews were put to work placing temporary shoring to hold the steel until reinforced-concrete arch and wall

(Continued on next page)

MONEY SAVER

on rock-ridden jobs

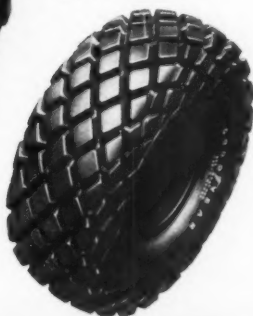
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Soft Ground Hampers Railroad Tunnel Job

(Continued from preceding page)

lining was poured. This slowed up the squeeze but did not stop it until the entire section involved was pressure grouted. For the next following 400 feet the ground conditions were similar. The concrete lining had to be carried close up to the heading in increments of 36 feet, mining and pouring alternately.

Farther in, something almost as bad cropped up to plague the miners. The ground suddenly changed to a soft tricky material much too unstable to drill and shoot. There was but one thing to do: slow down, use breast-boards and driven spiling, as drillers with clay spades cautiously gouged loose every cubic foot of material. It was a slow, nerve-racking business, and it went on for 2,000 feet before they ran out of the material into rock where the going was good.



F. Moss and L. Hutton of Goodall Rubber Co. inspect the Conway mucker belt at the tunnel heading. The belts handled as much as 35,000 yards of excavation.

Despite the slowness of this part of the work, the caution of the men deep down under the mountain never relaxed, and the tunnel excavation was finished safely without even a single cave-in. But there were times when it took two 8-hour shifts to install one set of breastboards.

Concrete Lining

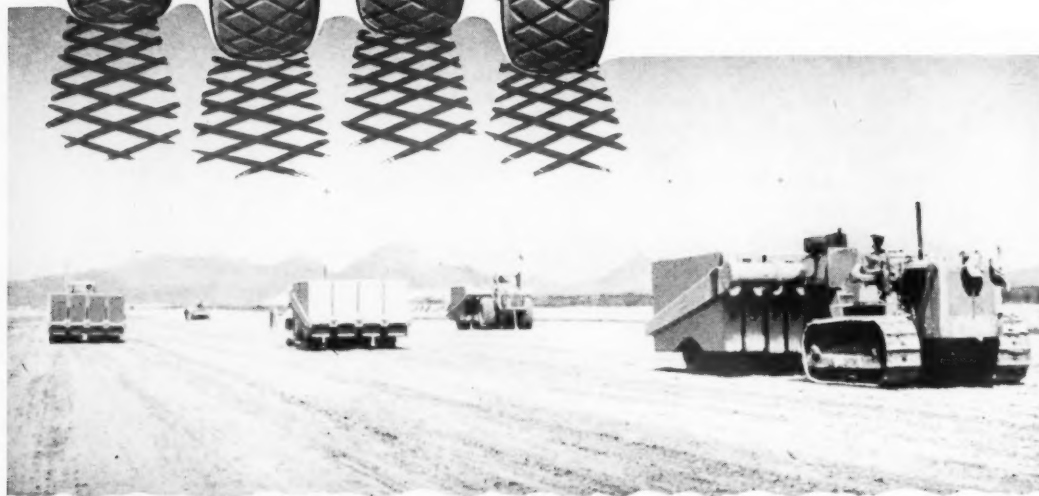
The concreting setup for the installation of tunnel lining consists of a Noble automatic batching plant, set up in the yard, and rail-mounted carrying equipment for transporting the concrete. A feature of the Noble plant setup is the fact that Project Engineer Hageman made it a one-man operating setup by using the natural topography to eliminate conventional methods of charging the bins. A timber bridge was thrown from a service road across the gully to permit aggregate trucks to back in and dump their loads direct to the bins. The plant also has a vertical boiler to furnish winter heat. It is all automatic, and requires no attention to speak of from the plant man.

The wall forms, which were placed to the spring line at the time the tunnel was excavated, consist of structural-steel panels with 3/4-inch plywood facing, 60 feet long, mounted on a special jumbo which gives 11 1/2 feet of vertical clearance and 16 1/2 feet of horizontal clearance to allow cars to pass through. This wall jumbo is so efficient that it can be set and both walls poured in a single shift. Concrete enters this form from a train of three 2-yard shop-built hoppers, which dump to a small conveyor at the foot of the jumbo. The concrete is then elevated to a surge hopper on the top deck, from which point it is buggied to the point of placement and vibrated by Viber internal-type units.

The arch form is a steel affair 78 feet long, which mounts on a jumbo running on a 3-foot gage track on the tunnel center line. For the critical 550-foot section which had to be placed during excavation, the arch form was supported on the drill jumbo. Its regular jumbo has two 100-ton Rodgers hydraulic jacks to control up and down movement, mounted on the bottom of the rig. Six 8-inch air jacks permit the form to be extended and retracted. This form also can be set and filled in one shift.

The method of placing the arch concrete differs slightly from that on the

compact heavier lifts with fewer passes



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The Southwest Roller has flexibility to suit varying job requirements. Weight-boxes may be filled with wet or dry sand, earth, scrap or other materials. Sectionalized hauling yoke permits use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 200 tons, suitable for light, medium or heavy duty compacting of earth.

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Each wheel of the Southwest Compaction Roller is mounted in an independent weight-box unit. Hinge point of wheel is at extreme rear of its own weight-box. Closely spaced wheels give maximum compaction with as much as 12" variance in height. Offers oscillating freedom and greater compaction on uneven ground

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				Dry Density lbs./ft. 3	Passing 5/8	% Moist	Dry Density lbs./ft. 3	Ratio	
				Actual	Corrected	Moist	Pass 5/8	Don.-Opt.	
							Pass 5/8	Pass 5/8	
Silty Sand	SM	6	7.3	128.0		8.0	133.6	96.0	
Sandy Clay	CL	6	10.2	110.0		15.3	116.2	95.5	
Sandy Clay	CL	6	14.3	114.0		15.3	116.2	98.0	
Sandy Silt	ML	6	14.6	115.0		14.2	120.8	92.0	
Clayey Sand	SC	6	9.2	125.2		10.2	128.3	97.8	
Silt	ML	6	6.6	119.0		9.5	125.0	95.0	
D.G	SW	6	8.7	126.7		9.2	132.0	96.0	
D.G	SW	6	5.2	129.0		7.8	135.0	96.0	
Straight Clay	CL	6	6.3	122.8		10.3	127.1	96.6	
Pit Run	GW	6	4.8	133.5	126.5	7.7	134.5	95.0	

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N.Y.

tunnel walls. A Press-Weld pneumatic concrete placer is used to force the concrete into the form. Vibration is by electric machines.

To eliminate cold-weather danger, it was decided to place the first 700 feet of the arch concrete before winter. The arch lining will then move to the south end of the tunnel, and work back toward the portal. As the arch is finished the tunnel will be finished. Guinn expects the arch concrete to be finished—and consequently the Kennecott \$2,750,000 job completed—before the first of 1953.

For interest, for difficulty, and for adverse conditions, Guinn ranks this tunnel very close to the toughest one he ever did—a tunnel at Ellensburg, Wash. Yet in that part of the bore where the formation was favorable, his miners set what Guinn believes to be a world record for speed.

Personnel

Assisting Guinn and Hageman as they pushed the job through were Hap Tolman, George Anderson, and Roy Anderson. They acted as shift superintendents and stayed through the completion of the job.

Kennecott Copper Corp.'s Bingham operations are under the general supervision of L. P. Buchmann, Manager of the Western Mining Divisions, with headquarters in Salt Lake City. Lee Jones is Chief Engineer of the Utah Division at Salt Lake City, and Charles Sax is Chief Mine Engineer at Bingham Canyon.

St. Lawrence Seaway Means Big Contracts—for Whom?

A total of \$500,000,000 will go into the St. Lawrence Seaway power-and-development project. Of this \$300,000,000 will be for the seaway and \$200,000,000 for the electric-power development. Naturally there is considerable interest among contractors and engineers as to who is going to land these handsome contracts. Canada is running the project alone as things stand at the moment. So Canada is the one to award the contracts. If, however, the digging of the seaway should eventually become a joint U. S.-Canadian effort, U. S. contractors would automatically become entitled to a much larger share of the contracts than they are likely to get otherwise.

Everyone wants a hand in this project, it seems. British, American, German, Dutch, and Italian companies have already shown interest, while Canadian contractors, needless to say, have high hopes, too. But in their case it is thought that much of this vast scheme lies beyond the scope of their existing equipment. When they have taken all they can handle, there will be millions of dollars' worth of contracts left for foreign concerns.

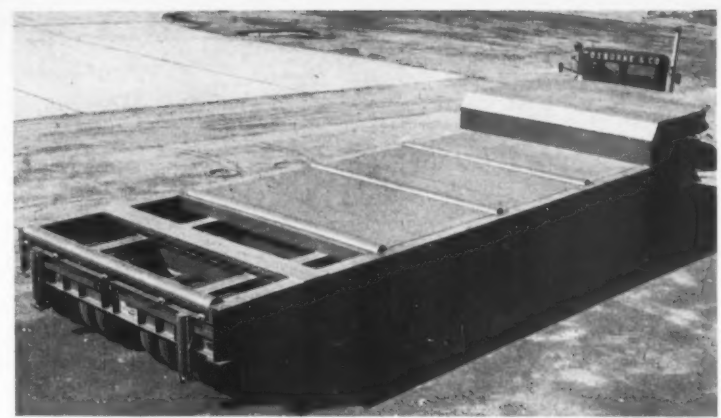
The British—apart from the Canadians—will have the inside track and have already sent representatives to explore the size and nature of the jobs

on which they can bid. Practically all British electrical manufacturers have the electrical power plants high on their priority lists, and the whole scheme offers an opportunity to increase British-Canadian trade by allowing Britain to earn more Canadian dollars without competing with Canadian industry. It will be necessary for Canada to import large quantities of specialized machinery, and some British firms are thinking of buying an interest in Canadian engineering companies to facilitate this and give them a lasting interest in Canada's development.

U. S. companies will certainly get the contracts for all the power-project work that has to be done on the U. S. shore of the St. Lawrence.

Mandt for Bushwacker Sales

Vernon Mandt has been appointed Sales Manager of the Bushwacker Division of American Steel Dredge Co., Inc., Fort Wayne, Ind. He was formerly Sales Manager of the Mandt Mfg. Di-



This new 75-ton semitrailer is made by Birmingham Mfg. Co., P. O. Box 1351, Birmingham, Ala. It features three 100-ton deck rollers and one tail roller. The deck is 13 feet wide and 30 feet long. Circle No. 199 on Card at page 18.

vision of Pettibone-Mulliken Corp., and founder of the Mandt Mfg. Co. The Bushwacker Division manufac-

tures Bushwacker brush-clearing equipment which is distributed through International Harvester dealers.

what's YOUR headache.

ROCK ?

On an A-W Power Grader the bulldozer becomes a rough, tough tool . . . extra sturdy to match the extra power of ALL-WHEEL DRIVE, and fully up to this job of clearing a rock slide.

SAND ?

Live, climbing power at both ends of the machine keeps it bulldozing steadily through sand where an ordinary grader would find it difficult to travel, let alone work.

EARTH ?

On this railroad fill, there is plenty of power and traction to use both blades, with their fingertip hydraulic controls for quick and easy, precision operation.

TREES ?

First, the grader blade with its deep-plowing ability is socked into the ground to undercut the tree roots; then the bulldozer backed by the superpower of ALL-WHEEL DRIVE finishes the job.

The traction and maneuverability of A-W Power Graders make them ideal tools for the Bulldozing jobs found on grading and construction work. Heavily made and reinforced to accommodate the extra power of All-Wheel Drive and Steer, the Bulldozer is an essential for many jobs—a time and money-saver for dozens of others.

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NO FRAME REQUIRED

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RUNNING FOOT F.O.B. KC., MO.

NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still \$2.50 ea.

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327 SO. WEST BLVD., KANSAS CITY 8, MO.



The Model RHU bituminous distributor comes in 800 and 1,000-gallon capacities. It is designed for use in secondary-road work.

Distributor Model

An improved bituminous distributor for secondary-road work is offered by Rosco Mfg. Co., 3118 Snelling Ave., Minneapolis 6, Minn. The Model RHU comes in 800 and 1,000-gallon-capacity

units with pumping unit and burners at the rear. It handles all types of bituminous material and maintains constant pressure through a by-pass valve.

Material is heated with two Rosco generating torch-type burners with air-cooled flue-protection shields. The

8-foot spraybars are the stationary, suck-back, nonfolding, detachable type. The pumping unit is a .20-hp Wisconsin engine.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 121.

Wire-Rope-Sling Handbook

A new 106-page handbook on the use and selection of wire-rope slings has been issued by Rochester Ropes, Culpeper, Va. All important types of slings are described and illustrated, and the book is bound so that the pages lie flat wherever it is opened.

Charts and tables for figuring tension in sling legs are included. A special section describes how to gage, seize, and splice wire rope. Information on socketing wire rope, applying wire-rope clips, and preparing rope ends is included.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 154.

State Gasoline Taxes

To the Editor,

CONTRACTORS AND ENGINEERS MONTHLY

In our opinion, your statement in News and Views on page 2 of your October issue, wherein you say "gasoline taxes are twice what they were in 1946", could be misinterpreted.

Without the Federal tax, the average state gasoline tax in 1946 was 4.11 cents per gallon, and in 1951 it had risen 4.74 cents, or slightly less than a 15 per cent increase. Subsequent to the 1951 compilation, there have been some changes, and, offhand, there were a few states, possibly seven, that increased their gasoline tax 1 cent, but most of these states have as their total tax either 4 or 5 cents, and in one instance, that of Missouri, the tax was increased a whole 50 per cent—from 2 to 3 cents. At the same time, two states decreased their tax from 7 to 6 cents, and one state from 9 to 7 cents, and, without making a mathematical determination of the percentage, it doesn't appear that it would be much different than the 1951 total. In view of this, we feel your statement that they were twice in '52 what they were in '46 could be misleading. Actually, the 1932 tax is still not doubled.

In the event you were using gross gasoline-tax collections of states in that period, they were in 1946 approximately \$1,143,925,000, and in 1951 they were \$1,960,830,000. All of the foregoing is based on state taxes alone and without the Federal tax, which went from 1½ to 2 cents last year, and, added to the above figures, still falls short of doubling the 1946 amount.

We are calling this to your attention as we know you will be interested in these statistics.

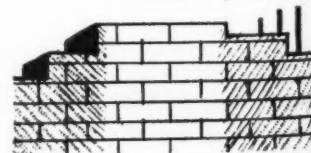
Sincerely yours,
Hal H. Hale,
Executive Secretary,
American Association of
State Highway Officials

Editor's Note: We thank Mr. Hale for his irrefutable statistics. We hoped to leave the thought that revenue from state gasoline taxes in 1952 is expected to double that of 1946. This forecast is based on an estimated 10 per cent increase in state gas-tax collections for 1952 over 1951. While part of this increase is due to higher gas taxes, most of it comes from increased consumption. Motor-vehicle registration reached a record high of 52,000,000 in 1952, as against 34,373,000 in 1946.

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Announcing General Motors Better Highways Awards

*\$194,000 in awards for the most practical solutions
to America's critical highway problem*

Every American is intensely aware of the inadequacy of our roads and streets to meet today's highway transportation needs. Yet too few have given thought to a practical solution.

It is a difficult problem, because modern highways cost a lot of money. But luck of them is costing even more!

To encourage all Americans to think about this critical situation and come forward with practical solutions, General Motors is instituting the GM Better Highways Awards for the best essays submitted on the following subject:

"How to Plan and Pay for the Safe and Adequate Highways We Need"

A total of 162 State, Regional and National Awards will be given for those entries which are considered best by an independent board of five judges. The following have accepted appointment to the board:

NED H. DEARBORN
President, National Safety Council
THOMAS H. MACDONALD
Commissioner, Bureau of Public Roads, U.S. Department of Commerce

CURTIS W. MCGRAW
Chairman of the Board, The McGraw-Hill Publishing Company

DR. ROBERT G. SPROUL
President, University of California

B. D. TALLAMY
Superintendent, New York State Department of Public Works and President, American Association of State Highway Officials.

Entries will be judged for originality, sincerity and practical adaptability—not on literary merit.

To help you in preparing your entry, background information about the present highway crisis has been compiled in "The General Motors Better Highways Awards Facts Book." A copy, containing official contest entry form,

will be sent you on request, or can be obtained from any General Motors car or truck dealer.

Contest closes midnight, March 1, 1953. Winners will be publicly announced as soon thereafter as the judging can be completed.

CONTEST RULES

1. WHO MAY COMPETE: Any individual who is a resident of a state of the United States or the District of Columbia may compete for an award, except Contest Judges and the members of their immediate families.

2. WHAT IS TO BE SUBMITTED: Each contest participant shall submit an original essay, with any supporting material or data the participant may desire, on the subject

"How to Plan and Pay for the Safe and Adequate Highways We Need"

3. HOW, WHEN, AND WHERE ENTRY IS TO BE SUBMITTED: To be eligible for award consideration, each essay must be submitted with an official entry blank which may be secured from any General Motors car or truck dealer or by writing to

General Motors Better Highways Awards, General Motors Building, Detroit 2, Michigan

Essays may only be submitted with a completed official entry blank, and must be mailed to the address immediately above.

To be eligible for award consideration, a contest entry must be postmarked not later than midnight, March 1, 1953, and must be received by March 14, 1953.

4. GENERAL REQUIREMENTS AND CONDITIONS CONCERNING ENTRIES: A participant by sub-

mitting an essay agrees to be bound by all rules of the contest. Each essay shall be in English, on one side of the paper only, and preferably typewritten. Illegible essays will be automatically disqualified. While brevity is suggested, no limitation is placed on the length of the essay. Participants should use the number of words they believe necessary. No essays will be returned. Upon submission, each essay and the contents and ideas therein become the property of General Motors Corporation which shall have the exclusive right to make unlimited use, in whole or in part, of the same. A participant represents by submitting an essay that its contents, in whole and in part, are original, and participant further represents that such essay has not been submitted, or in any manner disposed of, to other than General Motors Corporation.

5. AWARDS: Contents of essays will be judged for originality, sincerity, and practical adaptability. Awards in the number and amounts listed below will be made as determined by a Board of judges.

SIX NATIONAL AWARDS

First Award, \$25,000; Second Award, \$10,000; Third Award, \$5,000; Three Honorable Mention Awards, each \$5,000.

NINE REGIONAL AWARDS

For the best essay submitted from each of nine regional sections* of the United States, each \$2,500.

THE GENERAL MOTORS BETTER HIGHWAYS AWARDS

"How to Plan and Pay for the Safe and Adequate Highways We Need"

SIX NATIONAL AWARDS

FIRST AWARD \$25,000
SECOND AWARD \$10,000
THIRD AWARD \$5,000

THREE HONORABLE MENTION AWARDS . . . each \$3,000

NINE REGIONAL AWARDS

For the best essay submitted from each of nine regional sections* of the United States . . . each \$2,500

147 STATE AWARDS

49 First Awards, one for every state and District of Columbia each \$1,500

98 Honorable Mentions, two for every state and District of Columbia each \$500

*States included in each region are listed in "The General Motors Better Highways Awards Facts Book."

*States included in each region are listed in "The General Motors Better Highways Awards Facts Book."

147 STATE AWARDS

49 First Awards, one for every state and the District of Columbia, each \$1,500.

98 Honorable Mention Awards, two for every state and the District of Columbia, each \$500.

The selection of award winners will be made from all entries as a group. National award winners will be selected first and thereupon automatically eliminated from further consideration. Regional award winners will be selected next from the remaining entries and will automatically be eliminated from further award consideration. From the entries remaining after the selection of national and regional award winners, state award winners will be selected. No participant may win more than one award. In the event of ties for a particular award, or in the event that an essay of an employee of General Motors Corporation, or one of its domestic subsidiaries, is an award winner, duplicate awards will be made.

6. ANNOUNCEMENT OF AWARDS:

The names of all award winners will be announced as soon as possible after the close of the contest.

7. The decision of the Board of Judges with respect to awards and all other contest matters are final and binding on each participant.

8. The contest and awards made in connection with the contest are subject to all applicable local, state, and federal laws and regulations.

Address all entries to: General Motors Better Highways Awards, General Motors Bldg., Detroit 2, Mich.

New Construction— Not Traffic Circles

To the Editor,
CONTRACTORS AND ENGINEERS MONTHLY
With reference to the article beginning on page 30 of your October issue entitled "Traffic Nightmare Has Become a Dream," I must say that you are 100 per cent wrong.

During the 1930's New Jersey went hog-wild on traffic circles. The theory was to let 'em merge and they'd fight it out amongst themselves. The merging principle was entirely overrated. As traffic volumes grew after World War II, the limitations to the merging principle were glaringly apparent. New Jersey now is scrapping its circles by cutting lanes right through them for the major traffic stream, and returning to the days of the traffic light. The circle continues to serve a purpose, however, in eliminating left-turn bottlenecks. The design at Tonnele Circle is very fine; the result excellent. But let us give credit where credit is due. The New Jersey Turnpike has by-passed at least 90 per cent of the through traffic—particularly the northbound traffic that used to turn left at Tonnele Circle. We have the Turnpike to thank for relief at Tonnele Circle. You ought to write another article covering this relief all along the Turnpike's route.

The New Brunswick Circle has been sliced similarly. Here the result was bound to be poor due to the heavy cross traffic. This traffic to and from New Brunswick crossing U. S. 1 backs up morning and night at the new traffic lights. In a few years more construction will be needed here, for it will be seen that money spent this summer on slicing and traffic lights was spent foolishly.

Proof that credit for traffic relief belongs to the New Jersey Turnpike can be seen at the Elizabeth Circle. Formerly, it was a horrid mess—as bad as Tonnele. Plans were drawn for an overpass, but when it became evident how great is the relief due to the new Turnpike, the overpass idea was shelved.

Very truly yours,
Robert M. Youngs, Jr.,
Assistant Engineer,
N. J. State Highway Dept.

Editor's Note: An interesting comment on the way increasing traffic is catching up with superhighway relief, comes from the Pennsylvania State Highway Department. See the item on The Pennsylvania Turnpike below.

Growing Traffic Volume Offsets Turnpike Relief

When the eastern extension of the Pennsylvania Turnpike was opened, there were high hopes that it would afford the traffic relief so badly needed on the state's highways. Some initial relief was indeed afforded, but this has now, to a great extent, been offset by rapidly expanding traffic, Pennsylvania Secretary of Highways E. L. Schmidt announced recently.

"Before and after" studies of traffic flow on five state highways, plus traffic counts, show little substantial change in the volume of traffic that is moving over the main state highways in the eastern part of Pennsylvania. Of the five highways, one shows only 29 vehicles less per day than last year, while the annual traffic count for the other four highways is: 3,300, 1,100, 1,000, and 500 fewer vehicles than in 1951.

The conclusion reached by Mr. Schmidt is that, despite the construction of the Turnpike and the vast improvements made on the five highways under review, traffic volume today is nearly equal to that of a brief two years ago. "The lesson to be learnt," said Mr. Schmidt, "is that the state highway system in the immediate future must be brought up to

modern standards at a faster rate than ever before, if Pennsylvania is to continue to meet the rapid expansion of motor traffic."

New Compressor Sizes

Five new sizes of portable air compressors have been added to its line by Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis. The new capacities are 85, 125, 185, 250, and 365 cfm.

The company reports that the new range of sizes offers the air-compressor user exactly the capacity he needs to operate a given number of tools at adequate pressure, yet reduces excessive depreciation and other charges due to working with a compressor that is too big and too expensive for the job to be done.

The Le Roi line is now available in nine capacities, from 60 to 600 cfm. All but the smallest three can be supplied with Le Roi gasoline engines or Inter-



Here at work is a 125-cfm Le Roi air compressor, one of the company's 5 new ones.

national Harvester diesel engines. A choice of IHC, Murphy, or Caterpillar engines is offered for the 600-cfm model.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 198.

**I'M AHEAD \$1,463 A
YEAR ON EVERY
CHALLENGE 5 YARD MIXER
IN OUR FLEET!**

So says Roy Walton, left, President, Western Concrete & Equipment Co., Los Angeles, Calif.

"That's the actual figure that showed up on the profit side of our ledger when we decided to make an item for item cost analysis of our truck mixer fleet... comparing our Challenge 5 Yard Mixers with other make 4½ yard mixers.

"We took everything into account, believe me! We worked out the initial equipment costs, maintenance and repair costs, and every other item of expense. We worked out in detail the actual cost to deliver a cubic yard of ready mixed concrete to the job site.

*Figures are based on rated mixer capacity. A comparison on overload remains the same for both mixers because drum volume is in accordance with TMMB standards.



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- our Challenge 5 yard mixers save 19c on every cubic yard of concrete delivered...95c per load.*
- figuring 7 loads per mixer per day, we save \$6.65 per unit.
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Please send latest folder giving information on Challenge costs.

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A 35-Track RR Yard Bridged by Viaduct

With One Eye on Train Schedules, Contractor Begins Work
On \$1,413,655 Structure for U. S. 54 in Wichita, Kans.

• TRUCKS, tractors, cranes, and other heavy-construction equipment moved cautiously on the site of the new Kellogg Avenue Viaduct in Wichita, Kans. Thirty-five railroad tracks, four of them mainliners to the Union Terminal, intersected the highway right-of-way. Each phase of the construction operation had to be keyed to railroad timetables to insure a minimum delay to the rail traffic of this great midwestern city.

Swenson Construction Co., Kansas City, Mo., held the \$1,013,873 State Highway Commission contract which called for removal of the old structure and building of the new. An additional \$399,782 for structural steel, purchased by the State, brought the total cost of the structure to \$1,413,655. Directing the construction crews, Al Moret, General Superintendent, became a rail-roader in his own right. The structure spans the main makeup and switch yards—a distance of 2,000 feet—and it was imperative for the safety and efficiency of the operation that the work crews be informed of all train movements. Through skillful planning mishap was avoided and work proceeded on schedule.

Function and Design

The viaduct joins two 11-mile relocated sections of U. S. 54 and replaces an old structure unable to carry the anticipated traffic loads. The former structure arched over the tracks on a 6 to 7 per cent grade that made it difficult for vehicles to obtain sufficient traction in icy weather. Furthermore it carried only two traffic lanes, definitely insufficient for the expected use of the highway. U. S. 54 is the main east-west Chicago to El Paso, Texas, highway through this section of the country and intersects all of the transcontinental north-south routes.

The new structure is 2,072 feet 1½ inches long. It contains four independent viaduct units, each separated by expansion joints. The two center units, 945 and 800 feet long, rise on a vertical curve that crowns 12 feet 9½ inches at the center of its 1,620-foot length. The outside ends of the center units and the two 160-foot end units rise to the curve on a 3.16 per cent grade.

The structure is 67 feet 11 inches wide. It carries two 12-foot traffic lanes and a 4-foot 9-inch sidewalk on each

side. The opposing traffic lanes are separated by a 4-foot-wide concrete divider raised 4 inches above the roadway. The lanes on each side are marked by 6-inch-wide black iron-oxide traffic markers set in the concrete surface. There is an additional 2-foot gutter and an 18-inch-high deflecting curb to protect pedestrians on the sidewalks.

The roadway deck is composed of 6½ inches of concrete, reinforced top and bottom in both a longitudinal and transverse direction. The roadway surface slopes toward the curbs. The inner

8-foot section is on a 1-inch parabolic crown; the remaining 16 feet and gutter slope ¼ inch per foot. The roadway is supported by 10 continuous longitudinal girders, 6 feet 4 inches on centers, varying in size from 24 WF 110's to 36 WF 194's. The outside beams are heavier than the other eight in each span to take the additional load of the sidewalks which cantilever out from the curb line. Channel and I-beam members, 17 to 26 feet on centers, form the girder diaphragms. All steel work is riveted.

The viaduct girders are supported by a series of piers, 50 to 90 feet apart, rising up from the railroad yard. Each pier is composed of four columns on pedestal footings with a reinforced-concrete cap. The cap is 6 feet 6 inches deep, 3 feet wide, and measures 60 feet long. The columns are 3 feet square, reinforced with twenty 1¼-inch-square rods 4 inches back from the face, and all hooked into the footings. The steel is tied with ½-inch-round bars spaced in pairs 12 inches

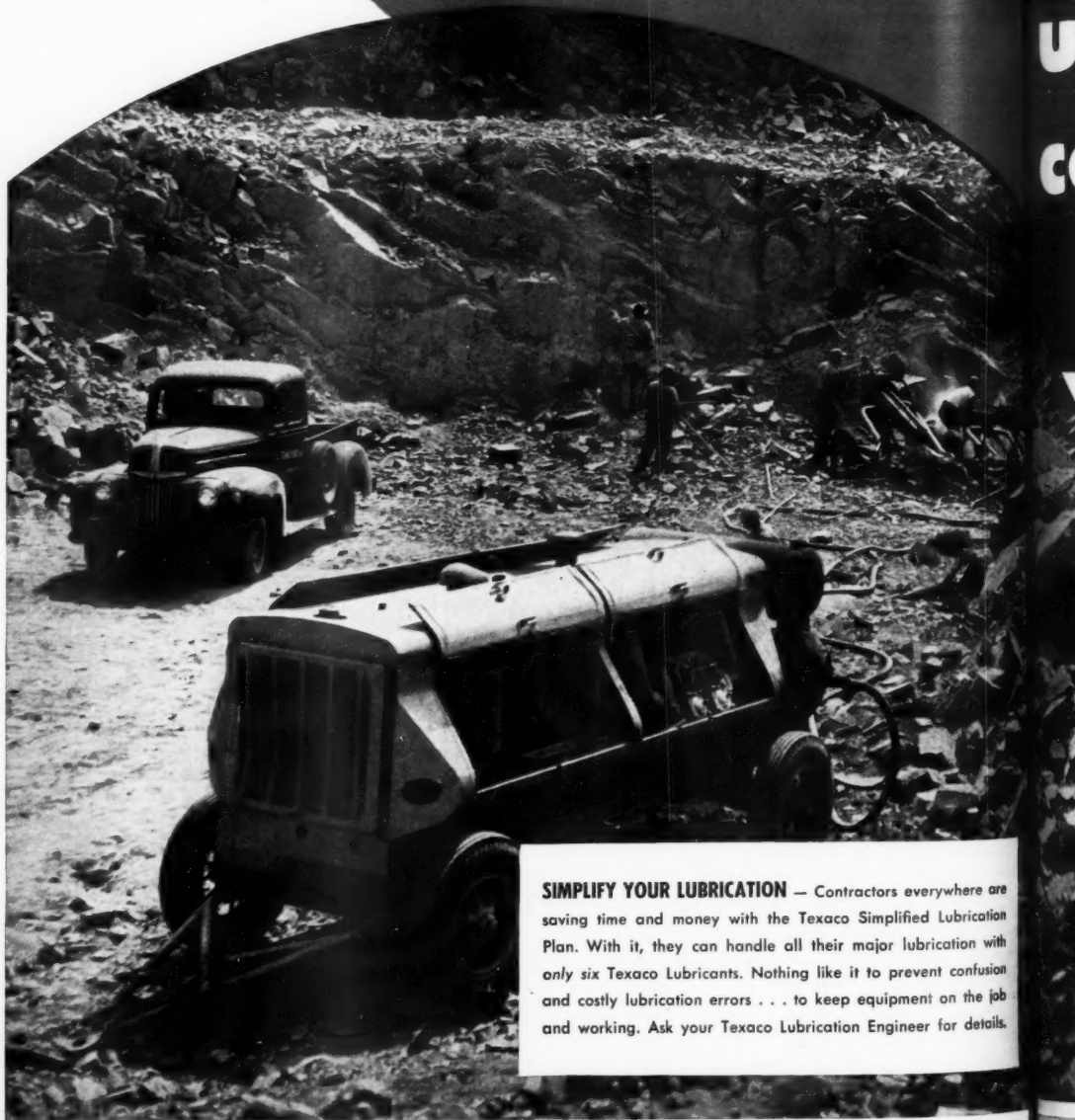
apart through the height of the column. The columns and cap are notched with double 3-inch cutbacks at the corners and edges to give the structure pleasing architectural lines.

Footings for the columns vary in size: the inside ones are 15 x 7½ x 4 feet deep on the average; the outside ones 10 x 7½ x 3 feet 3 inches. They are reinforced with ¾ to 1-inch-round hooked bars in both directions. The reinforcing is set 3 inches above the foundation piles, which extend 1 foot up into the footings. The number of piles for each pier varies from 44 to 64. The piles are treated timber with a 14 to 18-inch butt and 9-inch tip. They were driven to refusal and designed for a minimum bearing capacity of 20 tons.

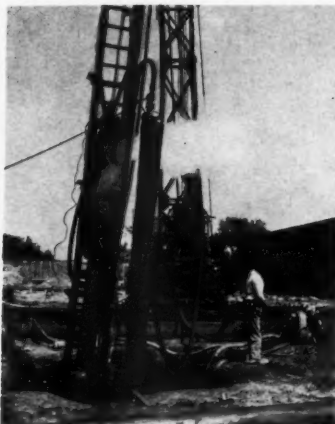
Removing Old Structure

Work started January 29, 1952, one day after the work order was issued with the demolition and removal of the existing structure. A Manitowoc Speed crane carrying a 3,500-pound—or on

MAINTAIN F



SIMPLIFY YOUR LUBRICATION — Contractors everywhere are saving time and money with the Texaco Simplified Lubrication Plan. With it, they can handle all their major lubrication with only six Texaco Lubricants. Nothing like it to prevent confusion and costly lubrication errors . . . to keep equipment on the job and working. Ask your Texaco Lubrication Engineer for details.



C. & E. M. Photo

G. J. Dietz, owner of Everham-Aldridge Co., Kansas City, Kans., subcontractor, looks at the rig. Powered by a 45-hp American hoist, it was used to drive the 35 to 45-foot-long timber piles supporting the viaduct piers. The hammer is a 30C Super-Vulcan.

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STAR THEATER
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on television
Tuesday nights.
METROPOLITAN OPERA
radio broadcasts
Saturday afternoons.



TEXACO



C. & E. M. Photos

At left, concrete for pier footings on the U. S. 54 viaduct project is chuted from a 3½-yard Smith mixer, mounted on a White cab-over-engine truck. The DeWalt 16-inch radial-arm saw, (above) handled most of the form cutting on the job. Swenson Construction Co., Kansas City, Mo., was the contractor.

occasion a 5,000-pound—"headache ball", handled most of the work. A Northwest crane with a 1,000-pound ball broke away the lighter sections.

Swenson elected to start at the difficult section over the mainline tracks first. He worked west until half of the job was done, and then returned to the

center and worked east. An International TD-18 tractor, mounting a front-end shovel, loaded the debris into a dozen rented trucks for spoil as riprap

on nearby flood-control work. All of the demolition work proceeded without incident and was completed in about 43 days.

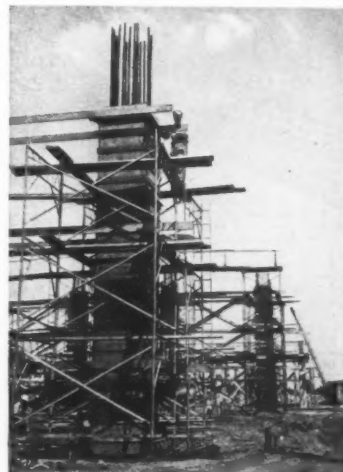
When the two cranes had finished their measure of destruction, they were fitted with ¾-yard clams and began excavating the pier footings. The contractor scheduled erection of the new structure in the same manner he had removed the old—working west from the center, then east. As a small part of each phase of the work was completed, he started the next. Thus as the work progressed, all phases of activity—excavation, pile driving, forming, and concrete pouring—were active. The footing holes were 4 to 8 feet deep and 10 x 18 feet in area on the average. The soil was fairly stiff so no sheeting was required, except for the holes on each side of the mainline tracks. Here, Swenson drove a row of sheet piling 12 feet long, to retain the rail embankment during excavation; next to the track the length of piling was increased to 22 feet.

Pile Driving

As soon as a few of the holes had been opened up, work started on the pile driving. Everham-Aldridge Co., Kansas City, Kans., held the subcontract on this phase of the work. They used a 40-ton skid-mounted rig which they had built to their own specifications. It carried a 45-hp 3-drum American hoist and boiler and 75-foot steel hanging leads. The hammer was a 30C Super-Vulcan delivering 7,200 pounds per blow at the rate of 130 blows per minute. A "gravy bowl" set on the pile butts kept them from spreading during the driving. The tips were fitted with steel points—arrow-shaped ⅝-inch plate steel 24 inches long, secured with 60 penny spikes.

The piles were jettied through the upper soil stratum—10 feet of sandy

(Concluded on next page)



C. & E. M. Photo

Forms for pier columns were set by carpenters working from a series of Waco adjustable steel scaffolds. Pier spacing varied from 50 to 90 feet.

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You can keep full air pressure at your drills only by keeping your compressors running cleanly and efficiently. Here you must depend on effective lubrication . . . and because *no one oil* can assure this under *all* operating conditions, there is a complete line of Texaco air compressor oils . . . one exactly right for *your* conditions.

For example, a Texaco *straight mineral* air compressor oil is your best bet for normal conditions. If "wet cylinders" are causing excessive wear, you should use a Texaco *compounded* air compressor oil. If rusting is a problem, you can overcome it by using a Texaco *rust-inhibited* air compressor oil.

FOR YOUR ROCK DRILLS use *Texaco Rock Drill Lubricant EP*. You get superior lubrication plus longer drill life and reduced maintenance costs because of its "extreme pressure" properties. In addition, it protects against rust whether drills are running or idle.

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A 35-Track RR Yard Bridged by Viaduct

(Continued from preceding page)

clay and 20 to 25 feet of sand and gravel—with a 3-inch jet pipe delivering water at 125 psi. When the piles reached the clay shale 35 to 43 feet below the ground surface the jet was removed and driving operations started. All piles were driven to refusal.

Concrete Work

Pier footings were formed with 2 x 10 sheeting braced with 2 x 4 studs, 2 feet on centers and laid flat, and one ring of 4 x 4 wales, 12 inches from the top of the form. The four sides were also braced with 2 x 4 strongbacks and kickers. All form cutting was handled on the site with a 16-inch Superior woodworker table saw and a 16-inch DeWalt radial-arm saw. The forms were coated with a light-base paraffin oil.

Walt Keeler Co., Inc., Wichita, supplied the concrete in 3½-yard Smith transit mixers mounted on White WA-122 cab-over-engine trucks. A Dart vibrator, powered by a portable Wisconsin engine, consolidated the mix as it was chuted directly from the trucks into the forms. Three air tampers powered by a Joy 105 portable compressor backfilled soil around the footings.

With the footings in place Swenson moved ahead on the columns and caps for the piers. The columns were formed with ¾-inch plywood and secured with ¾ x 4-inch plywood bonds, 12 inches on centers, and Roos hinged-bar-type column clamps at various spacings. All column forms were guyed by two ¾-inch cables on each side. The guys were anchored by two 3-foot steel pegs driven into the ground and were fitted with turnbuckles for tightening. Workmen built the forms and set column reinforcing from a series of 5 x 5 Waco scaffolds on each side of the pier.

The pier-cap forms (and later the weight of reinforcing and wet concrete) were carried on a series of 4 x 4's, transverse to the axis of the cap. The whole assembly rested on a 15-inch-wide flange I-beam on each side of the pier. The beams were supported on 8 x 8 timber post blocks down to the footing and tied with 2 x 8 diagonal bracing timbers.

A Northwest Model 25 crane with a ¾-yard Heltzel bottom-dump bucket handled the concrete pours. All but the top 5 feet of the column and cap was poured through an 8-inch rubber tremie made by the Garco Co. of Los Angeles, Calif. A Maginniss portable electric vibrator worked the concrete in and around the reinforcing.

All concrete on this job was a Class

A 3,000-pound mix. Maximum stone size was 1 inch. A typical 1-yard batch contained 564 pounds of cement, 36 gallons of water, 1,098 pounds of sand, and 1,680 pounds of stone. Cylinder tests averaged 5,000 psi.

Quantities and Personnel

At the time CONTRACTORS AND ENGINEERS MONTHLY visited the project, work had not started on the superstructure. The steel erection was subbed to John F. Beasley, of Muskogee, Okla.; Swenson handled the placement of concrete deck.

Quantities for the project were as follows:

Rock excavation	130 cu. yds.
Common excavation	14,120 cu. yds.
Class III excavation	4,707 cu. yds.
Class A concrete	6,342 cu. yds.
Reinforcing steel	1,033,550 lbs.
Structural steel	3,943,270 lbs.
Bearing devices	119,090 lbs.
Treated-timber piles	61,351 lin. ft.
Metal pile points	1,455 each

The construction forces were under the direction of Al Moret, General Superintendent. Forest D. Mead was Proj-

ect Engineer, and J. W. Laird, Timekeeper, for the general contractor.

Representing the Kansas State Highway Commission on the job were Ralph O. Smith, Resident Engineer, and Rex P. Whitaker, Project Engineer. R. C. Keeling is State Highway Engineer, and Gale Moss is Director of Highways.

A New Road Sweeper

A new line of improved tractor-mounted as well as both traction-powered and engine-powered pull-type sweepers has been developed by Meili-Blumberg Corp., New Holstein, Wis.

The Model 53M engine-driven pull-



type sweeper is powered by a Wisconsin VE4 engine with built-in heavy-duty clutch. It has a 30-inch diameter 96-inch brush that is quickly set at a 30-degree angle to sweep a 78-inch path to either the right or the left. The brush frame is equipped with a balance spring which enables the brush to float over uneven surfaces. The brush is lowered and lifted by a hydraulic pump and ram and there is a safety brake lock for high-speed trailing.

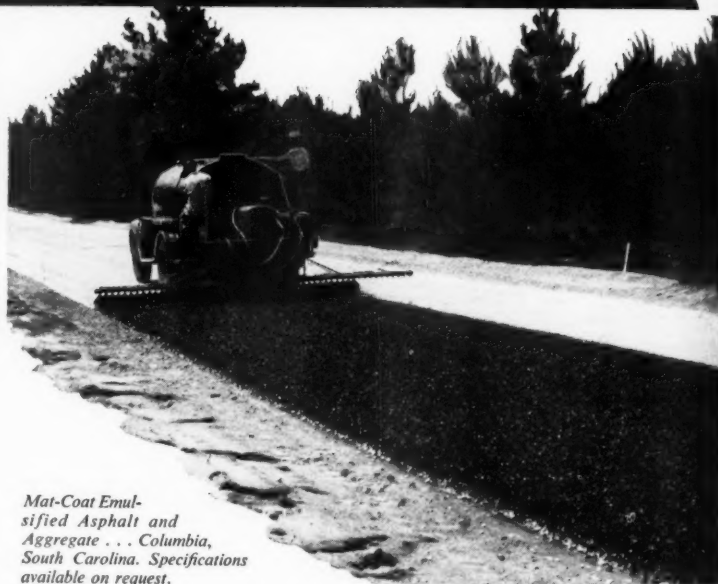
Wheels have Timken roller bearings and all shafting has self-aligning ball bearings. All the hardened-steel sprockets and roller chains are guarded and the pressed steel brush hood extends the full length of the brush and curves around the ends. The brush is set to rotate at the best operating speed of 140 rpm, but can be varied by changing the engine speed. A sprinkler attachment is available.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 175.

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(1) Reising Construction Co.'s special ditcher digs and finishes canal sides in one operation near Edinburg, Texas; then wire-mesh backing is unrolled along the side of the ditch and (2) concrete is pneumatically sprayed on.

Ditcher Excavates And Grades in One

A great deal of hand labor has been eliminated on the \$1,500,000 31,349-acre irrigation project started last December for the Hidalgo County Water Control and Improvement District No. 15, near Edinburg, Texas, and now nearing completion. The labor-saving device is a special ditching machine designed and built by the prime contractor on the job, Reising Construction Co., Edinburg.

The project included the construction of 20 miles of concrete-lined irrigation canal and approximately 100 miles of 12 to 30-inch concrete pipelines. Reising's novel machine—a modified Buckeye No. 9 ditcher—has been excavating the canal and doing the final grading in one operation. The unit has two cutter wings mounted on its sides. These winged cutter bars are powered by an International U-4 engine, and they slice through the earth to provide a smooth V-type ditch ready for pneumatic concreting. According to the contractor, the ditcher does double the work of a dragline and 40 laborers. Coming along behind other equipment which was building cuts and fills at various places along the route, the ditcher completed an average of 800 feet of ditch in each 9-hour day. Once the canal sides were cut and graded, wire mesh was laid along the sides and concrete was pneumatically applied to provide a waterproof lining. This part of the job was handled by the water district. For the concrete pipeline, Reising has been using conventional-type ditching machines.

The largest canal in the system is 8 miles long, 23 feet wide at the rim, and 10 at the bottom. It feeds some 12 miles of smaller canals, and the whole system, when completed, will bring ample water to a rich citrus-growing area.

BRAB Report on Condensation

The problems of condensation are complex. There are so many products and methods involved that organized study of the subject proceeds slowly. In an effort to speed up the study and solve the questions, the Building Research Advisory Board of the National Research Council held a conference to take stock of the problem and has published its findings in a book, "Condensation Control in Buildings".

This publication might be considered a record of where research stands today on the topic of condensation. It contains the most recent opinions of recognized leaders in the field, and presents—in the form of panel discussions—the many unsolved problems. Among the general headings are The Problem and Its Causes; Technical Progress; and Future Technical and Educational Opportunities. Specific topics include: the movement of moisture in building materials; water permeability of paint materials for wall construction; paper and foil films; and the influence of construction methods and materials on condensation problems.

meability of paint materials for wall construction; paper and foil films; and the influence of construction methods and materials on condensation problems.

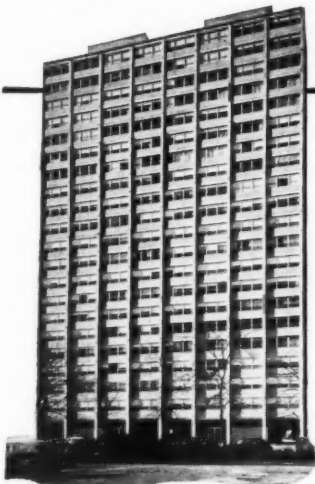
lems. The book is plentifully illustrated with pictures, diagrams, and charts.

Single copies priced at \$3.50 may be obtained from the Building Research

Advisory Board, 2101 Constitution Ave., Washington 25, D. C. Quantity prices will be quoted on request to the Board.



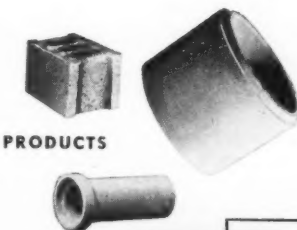
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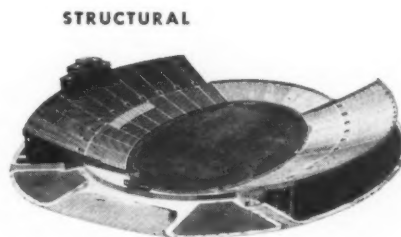
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You can have these advantages simply by specifying Atlas Duraplastic. It costs not one penny more than regular cement. No extra bother . . . just ordinary good care and procedure. Complies fully with ASTM and Federal Specifications. For more information, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

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Specialists Install High-Type Patching

Texas Maintenance Men Build Long-Lasting Smooth Patches, While Keeping an Eye Open for Careening Motorists

By R. N. JENNINGS
District Maintenance Engineer
Texas State Highway Department
With RAY DAY

• AT San Angelo, where District 7 of the Texas State Highway Department is headquartered, eight groups of maintenance men have built themselves a solid reputation. They have maintained 1,450 miles of highway in spite of traffic sometimes estimated at 100 an hour and over.

These men are as wary as coyotes in a chicken coop. They know their job is one of the most dangerous in Texas. Motorists crash through an average of 3 outer-zone barricades every week. One day when the crew was eating lunch, a speed demon hit a patching roller a glancing blow, at an estimated speed of 110 mph. Being a Texan, he and his three passengers survived. But every maintenance man in the San Angelo district has outgrown any trust he might have had formerly, even for Texans, if they are behind the wheel of a highway vehicle.

In dodging this constant danger, the eight crews have also standardized on the surface of asphalt highways with a maintenance program of premixed patches which in itself holds considerable merit for technical excellence.

Sizable District

District 7 is one of those borderline subdivisions of the Texas Highway Department too far west to be an agricultural or urban center, and too far east to be in the heavy oil traffic of the Permian Basin country. The counties in District 7 are either agricultural range country, or have light oil production. With the exception of about 80 miles of portland-cement concrete, all major highways are asphalt-surfaced. Penetration asphalt, road-mix, and higher types of asphaltic-concrete surfaces are included.

Several major transcontinental highways pass through the district, however, and the highest traffic counts are now up around 6,000-7,000 vehicles per day. Unsung and undramatic as the maintenance job is, it is likely that many of the roads would become extremely uncomfortable for travelers if maintenance were suspended even for a few months.

To police this vast mileage with a systematic program, 8 maintenance foremen have subheadquarters. These include W. H. Hopewell at San Angelo; Henry Pierce at Eden; Hubert Fields at Junction; S. M. Loeffler at Sonora; Scotty Houston at Ozona; Everett Roe at Barnhart; Jim Butler at Sterling City; H. P. Largent at Ballinger; and W. A. Vannoy at San Angelo, in general charge of equipment. R. N. Jennings is District Maintenance Engineer, and T. J. Kelly, District Engineer in general charge of all operations.

Methods No Cure-All

Good as they are, the maintenance methods used in improving the riding surfaces of highways in District 7 are not a cure-all. Originated by many men, and improved by many others, present methods would no doubt give an excellent account of themselves if traffic were something short of what it is. But traffic through District 7 is typical of that in many other parts of the nation: the loads are getting heavier

and more frequent, and traffic is moving at a higher speed.

Under these conditions, why try to maintain the highways? Why not select the rough sections and say, "Let them go. When they get really bad, we will secure additional funds and rebuild them completely."

There is much to be said in favor of this point of view. It conserves maintenance money and permits maintenance equipment and forces to be placed on other tasks that will make a better showing for the time being. However,

District 7 has 150 miles of roads that are over 20 years old, and 500 miles that are from 10 to 20 years old. In the first six years after World War II, an average of 9 new miles per year was built. It is evident that until the rate of reconstruction is stepped up considerably, no gamble can be taken by allowing rough roads to deteriorate.

Fortunately for District 7, a large mileage of the highways has fair-to-good alignment and pavement and structure width, as well as fairly stable bases, so that the traveling public can get by for many more years so long as maintenance men can continue to give them a road that rides smoothly and safely.

When is the best time to do this maintenance work? The answer to that question is *all the time*. However, one is forced to face the fact that maintenance men have countless other things to perform, that maintenance leveling is an expensive operation, and that certain weather conditions are not suitable for this type of work. District 7 has

adopted a policy of pulling the "backbreakers" out of its highways immediately, regardless of the cost or how much it inconveniences the performance of other tasks. The major portion of maintenance leveling is done in the spring and summer. If money is available, some of the missed spots are picked up in the fall. Every effort is made to get the leveling done prior to the installation of seal coats, so the appearance of the road will not be marred by the leveling operations. Where should such maintenance be done? District 7 answers that question by finding a balance point in the laws of highway economics. Obviously, any road could be made smoother if enough money was available, but there is neither enough money nor time in District 7 to start out on such an all-inclusive program.

The policy on where to work is simply this: on the worst places first. The "backbreaker" must be taken out wherever it is, because it is both uncomfortable and dangerous. In selecting

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PRECISION BUILT, two-compartment water tank assures accurate water measurement—even when mixer is not level.

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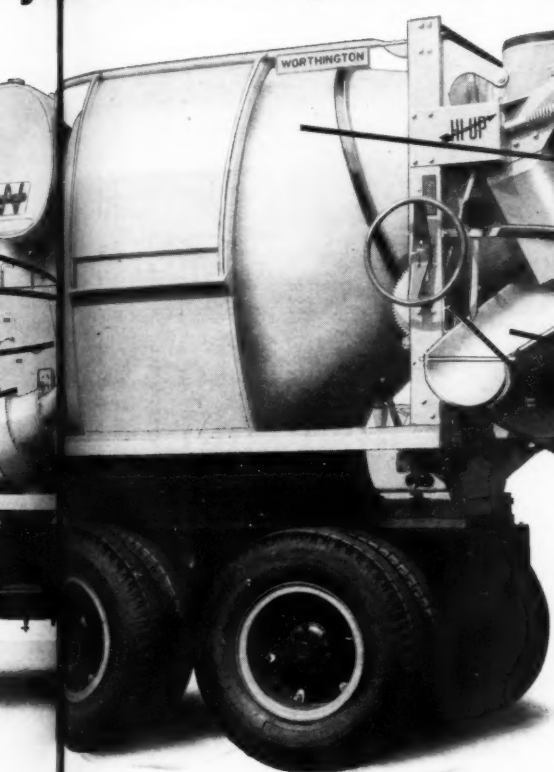
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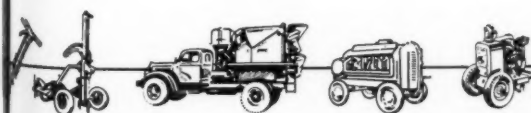
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It's A Construction Job, It's A **BLUE BRUTE** Job



Patching a road near San Angelo, Texas. A special tool roughs off a patch before the final trim. It is a piece of motor-grader blade mounted on rubber tires. Next (center photo) comes a man with a long-handled strikeoff template for leveling. Finally, (at right) a road roller, pulled by a Dodge truck, completes the patch.

roads to be worked on, District 7 considers the degree of roughness, amount and type of traffic, any programmed reconstruction, and, as has been mentioned, priority should be given to those sections that are to be sealed.

Several methods of improving the

riding surfaces are in use in the district, as follows:

1. Uvalde-rock asphalt pavement, placed by blading.

2. Blade-mixes of asphalt and aggregate, which may be either local material or crushed Uvalde rock.

3. Spot leveling, or patching.

The method selected depends on the funds available, on the degree of roughness in the pavement, on the time, equipment, and forces that may be used for the leveling, and on the amount and type of traffic using the highway to be

worked on. No one method may be the answer on some sections, and the crews often find that a combination of several methods may be better.

Rock Asphalt Often Used

Uvalde-rock asphalt pavement, placed by blading, has been used to level those sections of roads near a railroad. This is reasonably economical maintenance work. Uvalde-rock asphalt works well where there are concentrations of high and low spots in a limited area. A layer of leveling material over the entire surface in these places is an excellent method to correct this condition.

Type-D rock asphalt pavement is used for the most part in leveling. Some Type C is used on sections that demand a thicker layer to get the desired results. The amount used depends on the roughness of the old surface and on the width of pavement being leveled.

Approximately 4½ cubic yards of Type D is about the minimum that can be placed satisfactorily on an 18-foot pavement. When more than 7 yards per station are needed, it is best to place it in two courses to get the maximum results. If long stretches, with a varying amount of roughness, are being leveled, allowance should be made in the material placed to compensate for this variation, and District 7 maintenance men are good at making such adjustments. They find that a smaller amount of material will be needed to deliver good results if the larger depressions are taken out by spot leveling prior to the blade leveling.

A tack coat is placed before spreading the premix on the pavement. Extreme care is taken to hold the amount of emulsion to a minimum. Too heavy a tack will give an excess of asphalt in the leveled section, causing fat spots or worse—shoving. Small quantities of asphalt will give good coverage provided final distribution is obtained with traffic tires or a pneumatic roller.

The material is distributed to the pavement in several ways. Often a hopper box mounted on skids, with adjustable slots to permit variations of quantities placed, gives good results, and this can be pulled along by one of the dump trucks. After placement, the material is bladed until its moisture content has been reduced to a minimum, and then bladed into a uniform windrow on the edge of the pavement. The blade then starts spreading the material in the thinnest possible layers, or "dribbles", each layer being thoroughly compacted with a pneumatic roller and the final layer being flat-rolled as well. Final results depend in a large measure on the care taken as the work goes along, and particularly on the skill of the motor-grader operator.

Blade-Mixes Used

Blade-mixes of asphalt and local aggregates or crushed Uvalde rock are often used with good results. Their use is always dependent on whether the cost is lower than Uvalde-rock asphalt pavement, and upon the comparison of availability of materials.

(Continued on next page)

R.2.4

Specialists Install High-Type Patching

(Continued from preceding page)

Methods used in placing the blade-mixes are very similar to those used in placing the Uvalde premix, except that the asphalt must be introduced into the mixture by blading on the road, and the tack coat is placed in half widths after mixing operations are finished.

A small aggregate is used, with 100 per cent passing the 1/2-inch screen; 40-60 retained on the 3/4-inch; 75-90 retained on the No. 10; and 90-100 per cent retained on the No. 20 sieve. Both RC-2 and MC-3 asphalts have been used with good results on local rock, and RO-3 gives excellent results with the Uvalde rock. To get really good results with blade-mixing, warm weather is necessary. And Texas summers deliver that commodity generously.

The amount of asphalt used per cubic yard depends on the grading and characteristics of the aggregate. In this district, 15 gallons per cubic yard works best. However, the asphalt is put in very cautiously, in three to four shots, with thorough blading after each shot. The appearance of the mix determines the final amount added on the last shot.

Light-colored spots get a slight additional shot of asphalt so the entire mix will present a uniform color. A rotary broom is used in conjunction with the blades to keep the fines incorporated in the mix, and every effort is made to speed the processing to prevent the asphalt from becoming tacky before it is laid in. It is spread and rolled in much the same manner as the premix material. After the spreading and rolling work is complete, a covering of uncoated aggregate is spread over the mixture at the rate of about 1/4 cubic yard per station. This material is then thoroughly rolled and a certain percentage will go in voids of the mixture and stick. But its main purpose is to keep traffic tires from coming in contact with the fresh mixture and flushing any asphalt to the surface before it has a chance to become entirely stable.

Spot Leveling

Spot leveling gets its name from the fact that it is done in spots, rather than over a large area. The spots may be close together or scattered, depending on the degree of roughness of the pave-



Here is a complete spot-leveling setup: a flagman, traffic cones, lightweight barricades, and patching equipment.

ment. Long experience makes District 7 officials feel that the maximum results in both money and effort are obtained by this method. Although the high use of labor will boost the cost

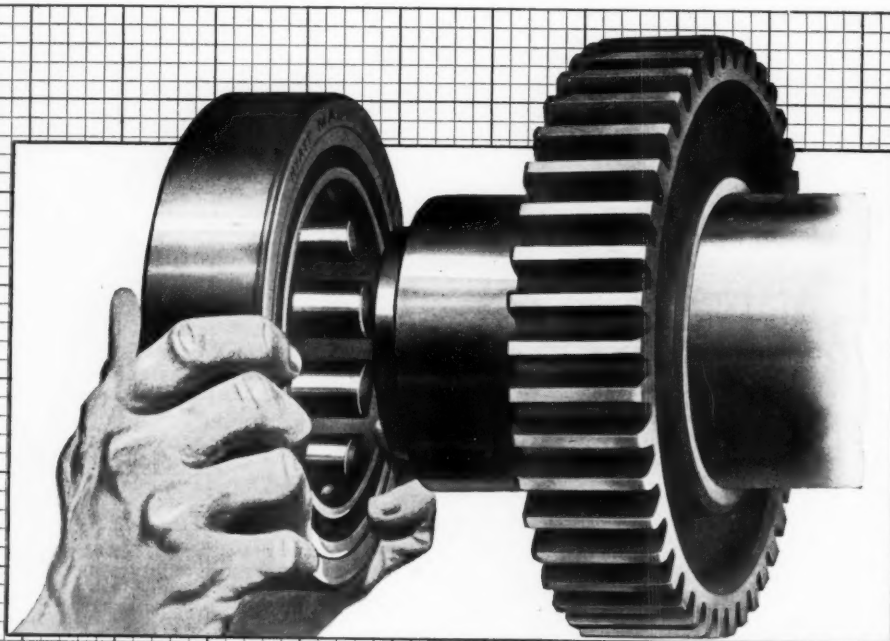
per cubic yard placed, a crew which uses good judgment in selecting the spots to be leveled can obtain excellent results by using very little material. It is all placed on the spot which causes

the rough riding. None is used to cover pavement that is riding satisfactorily.

The general location of spots to be worked on can be selected by riding over the highway and observing the spring action of other vehicles using the highway. Many veteran maintenance men have good roughometers built into the seat of their pants, and they work especially well when the men ride an empty truck.

A string stretched along the road is used to localize the low spots. A string at least 100 feet long should be used, because if too short a section is string-lined some of the causes of roughness may be overlooked. The low spots shown by the string are outlined by paint or asphalt. No effort is made to make the patches in regular shapes, because few holes occur that way. The odds are that a square or rectangular patch will ride rough.

The spot to be leveled is tacked lightly, with emulsion. That "lightly" is important, because too heavy a tack will come up through a patch and seal



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coat for years. In some cases, if the pavement is rich in asphalt, the best tack coat may be only kerosene. A mixture of kerosene and cutback asphalt makes a good tack when it is used in limited quantities. District 7 uses emulsion, primarily, because it feels that a mixture of emulsion with a variable quantity of water will give a tack to meet the varied conditions found in old pavements.

After the emulsion is tacky, it is covered with the leveling material. Most of this is Type D Uvalde premix. The material is spread out by blading or raking, and is checked with a straightedge to make sure that it is not too high, and that it featheredges out to the original pavement. The material is then rolled and again checked with a straightedge to see that no low spots remain. If some remain, additional material is added and the process repeated until the patch is perfectly smooth.

Maintenance crews have an unusual and effective instrument for smoothing out the material. It was originated by Section Foreman Jim Butler at Sterling City, and consists simply of a 5-foot section of motor-grader blade, mounted on small rubber-tired wheels by means of gooseneck frames. Two long wooden handles, which fold up when the instrument is stored away, help the operator manipulate it. The little instrument gives an excellent preliminary leveling ahead of the straightedge.

Few things are as important to good maintenance as careful workmanship. It is stressed constantly, for poor work not only causes the road to ride rougher, but it wastes dollars which are fast becoming too scarce.

Certain operations are sometimes required ahead of spot leveling. For example, every effort is made to seal cracks before the leveling material is placed. This is done by flushing asphalt in the crack and squeegeeing it down. Unless this is done, the crack has a way of working up through the leveling course before long.

Where the volume of traffic requires it, efforts were made to increase pavement widths at the same time leveling is done by means of blade work. This will sometimes mean that extra base material is placed. Where pavements are widened, a prime coat is placed on the widened portion with a slight overlap on the existing asphalt to provide as good a bond as possible.

Although various types of asphalt-surface leveling take up the spring, summer, and part of the fall months, maintenance men have other things to do as well. Culverts need to be cleaned out from time to time, weeds have to be mowed, and shoulders must be maintained, especially where truck tires whip the gravel away at pavement edges.

Safety a Big Thing

Most of the maintenance foremen in District 7 are old in experience, but strangely enough, when they get together in San Angelo once a month for their regular meeting, the conversations usually turn to safety. These are possibly as safety-conscious a group of men as you will find. They got that way because, like the coyotes in the chicken coop, they've been shot at.

No crew ever works until its barricades are in place. Each truck carries two light 30-pound barricades, two heavier ones for in close, and from 4 to 6 rubber traffic cones. In addition, there is a flagman at each end of the work. That flagman is exactly positioned, too. He is just far enough out so he cannot talk to the crew, and just close enough in so a warning shout, if he makes one, can be heard.

The light plywood barricades are placed deliberately on the center stripe. It is impossible to pass one without slowing down and going over to the edge of the pavement. Drunks, or drivers asleep, will invariably crash through

this barricade. It happens about 3 times a week. When it does, the barricade makes a great noise and men can scatter in time. There have been a few cases where motorists insisted on hurting themselves, but they have harmed none of the maintenance men. It may seem that the attitude of these men is tough. It is, admittedly, but it keeps them alive.

These monthly meetings produce a wealth of other ideas, too. Recently the district was having a problem painting curbs in towns, and applying the reflectorizing beads. Somebody in the machine shop suggested they do it uniformly with their sandblasting machine. He showed them how to load the sandblasting machine with beads, and how the mechanical method produced a uni-

form job, without wastage, behind the paint sprayer.

By working closely together, by keeping open-minded to things new, by standardizing wherever possible, and by preserving that spark of individual genius which lets each man think for himself, the maintenance men of District 7 have made of themselves a truly good organization.

Air-Entraining Agent

A new booklet on Ayr-Trap air-entraining agent has been issued by A. C. Horn Co., Inc., 10th St., and 44th Ave., Long Island City 1, N. Y. It covers the functions of entrained air in concrete, effects on hardened concrete and on the plastic state, and factors influencing the

amount of entrained air. Graphs and charts give information on bond strength, bleeding tests, compressive and flexural strength, and freezing and thawing effects.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 178.



A coil spring in every joint makes this wood rule more accurate and easier to hold. Further information may be secured from Eagle Rule Mfg. Corp., New York 59, N. Y. Or use Request Card at page 18. Circle No. 179.



HIGHWAY DEPARTMENT'S MOST USEFUL LOADER

Your Eimco can dig ditches, clean up slides, dig up shoulders, speed up new construction, in tunnels, loading trucks or in quarries loading rock.

The Eimco will load rock at the rate of 4 to 6 tons per minute average and sand or gravel at 6 to 8 yards per minute average.

The speed, efficiency and low cost of Eimcos make them preferred equipment in any highway department. Let us tell you of the many other advantages in using Eimcos.



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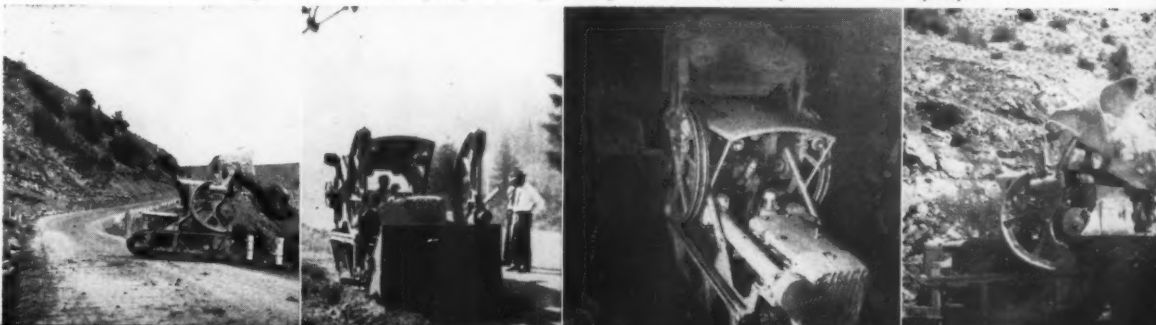
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You Can't Beat an Eimco

Above: Digging ditch beside highway in Canada. Below, left to right: Clearing rock off highways, taking out shoulder for highway widening, loading in a tunnel, loading trucks in rock quarry.





Here's how Carroll County, Iowa, efficiently handles its calcium chloride. Dow Peladon is shipped, conveyed, and spread in bulk. A Barber-Greene conveyor is unloading the material from a freight car.

Safety First When Using Salamanders

The season for salamanders is here, and with it the threat of serious accidents due to neglect and lack of understanding of the hazards involved. According to James A. Shaw, Editor of

the "Safety News Letter" of the Construction Section, National Safety Council, salamanders have caused many fires on construction jobs. Usually one or more of the following conditions are present:

1. Absence or improper use of fire-extinguishing equipment. CO₂ extin-

guishers work well on fires caused by oil salamanders; water only tends to spread the fire. Extinguishing equipment should be outside of the area being heated, not where the fire may cut you away from it.

2. Overheating of the salamanders, so that the resultant radiation ignites nearby combustible materials.

3. Failure to insulate the salamanders from floors or other combustible bases.

4. Failure to supervise salamanders and to provide watchman service.

The use of oil-burning salamanders has increased, and created two primary hazards: fire and gas. The following six precautions should be followed to avoid a fire:

1. Never light or relight the salamander with the damper closed.

2. Never use oil that may contain water. Water turns to steam, causes pressure, and results in the oil boiling over or being forced into the stack.

3. Never refill when the salamander is burning, for the fresh oil coming in

contact with hot metal, when the oil supply is exhausted, causes oil to gasify. This results in a large fire or explosion.

4. Never move salamanders while they are burning, for fear of spilling the oil.

5. Don't relight immediately after extinguishing. The oil, while still hot, produces gas which fills the bowl and stack chambers and will ignite or explode.

6. Never look down into the stack when lighting. There can be a sudden flare-up.

As regards the gas hazard, incomplete combustion of the oils used in salamanders will produce carbon monoxide, the invisible, odorless, and deadly gas produced by automobile motors idled in enclosed areas. A harmful concentration of this gas is easily produced when the amount of air used in the burning of the oil exceeds the supply of air available through openings in the heated areas. Therefore, salamanders operating in an enclosed area have caused many fatalities, and though the use of tarps permits a limited amount of free air to enter the area, the number of salamanders in operation may be large enough to consume it.

Where salamanders are used on a large scale, definite testing for gases is most desirable, and so is an exhaust system. On smaller operations it is essential that extra care be used to insure that adequate amounts of fresh air enter the heated areas. Where single employees must enter large enclosed areas heated by this method, the men should be supplied with emergency self-rescuers and should be warned of gas exposures and the danger of loitering. Any employee working in such an area should be instructed to go to fresh air immediately if he feels tired and sleepy.

In short, says Editor Shaw in his October newsletter, management should not only recognize the inherent hazards present in the use of salamanders, but should also take steps to see that no employees are unnecessarily exposed.

Bulletin on Frame-Type Pumps

A 4-page bulletin on its frame-type centrifugal pumps has been released by Allis-Chalmers Mfg. Co., 951 S. 70 St., Milwaukee, Wis. It points out that the pumps can handle most ordinary pumping jobs requiring capacities up to 500 gpm and heads as high as 135 feet.

Built for V-belt drive, the pump can be mounted in a variety of positions and connected to any type of prime mover without difficult alignment problems. Head and capacity can be changed by altering sheave size on the V-belt drive.

The booklet includes cross-section diagrams, performance curves, and dimensions.

This literature may be obtained from the company by requesting Bulletin 52B6691A, or by using the Request Card that is bound in at page 18. Circle No 133.

QUALITY . . . from raw material to finished axle, means lower-cost hauling



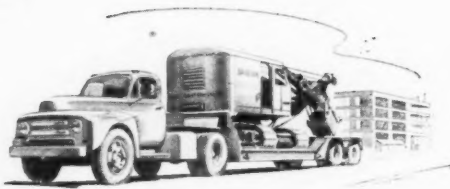
Exacting standards of quality, maintained by the most advanced quality control procedures, combine with the Eaton design to produce axles which are setting unequalled performance records at minimum cost per mile. Quality, plus Eaton's exclusive planetary gearing, forced-flow lubricating system, and positive shift control, keep Eaton 2-speeds on the job, out of the repair shop.

Let your dealer explain how Eaton 2-speeds provide the right ratio for every road and load, cut maintenance cost, make trucks last longer—and worth more on the trade-in.

Axle Division
EATON MANUFACTURING COMPANY
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The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

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The Oliver OC-18 works here with a Hail cable dozer.

olis, Ind., at 1828 English Ave. The new branch will provide quicker and more efficient service for the growing decorative hardwood-plywood needs of Indianapolis and central Indiana. The 122 x 216-foot warehouse building has a covered dock for loading and unloading vehicles in inclement weather and is serviced by a private siding of the New York Central Railroad.

The general office, showrooms, and other sections of the new unit are paneled in different types of wood to show the effect of various combinations of wood, paint, and plastic.

Lumber dealers, builders, manufacturers, architects, and home owners in central Indiana, served by the new warehouse, are invited to visit the showrooms.

Handbook on Wire Rope

A new wire-rope handbook has been released by A. Leschen & Sons Rope Co., 5909 Kennerly Ave., St. Louis 12, Mo. The 64-page book includes descriptions, diagrams, and illustrations of wire-rope types and constructions, as well as helpful information about lubricants, working loads, safety factors, and specifications. Forty separate charts give breaking strengths and weights of wire rope by constructions and sizes, along with calculations for the proper selection of wire-rope attachments.

This literature may be obtained from the company, or by using the Request Card that is bound in at page 18. Circle No. 127.

Heavy-Duty Tractors Feature Air Steering

An improved crawler tractor is announced by the Oliver Corp., 400 Madison St., Chicago 6, Ill. The OC-18 has air steering as standard equipment. It has an over-center clutch running across the whole width of the dashboard so the operator can easily locate it without taking his eyes off the job. Other features include push-button electric starting with a cold-weather starting aid, center-positioned gear-shift lever, parking brakes, throttle located at right arm rest, ample leg room, and comfortable two-man upholstered seat.

Oliver states that the tracks have been designed for maximum ground contact for more pulling power and stability and balance for dozing. The OC-18 has 126 hp. It can be operated efficiently in mud, rocks, or stumps because of its high clearance, the company claims.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 194.

A One-Man Chain Saw

A new chain saw for cutting trees and any other growth 6 inches in diameter—even under water—has been announced by Hoffco, Inc., 411 N. 8th St., Richmond, Ind. The Sawette enables the operator to cut at ground level while remaining in a standing position. Light weight is said to allow high degree of maneuverability with minimum physical effort.



Features include a 2-hp engine, concentric-bowl float-feed carburetor, 1-quart gas tank, 12-inch tempered spring-steel blade bar, 1/2-inch pitch chisel tooth, and 32-inch-long saw chain. The unit weighs 26 pounds and is painted highway yellow with red trim.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 196.

Branch for U. S. Plywood

U. S. Plywood Corp., New York, N. Y., has opened a new and larger sales and distribution unit in Indianapolis, Ind., at 1828 English Ave.

**DON'T LET THIS
HAPPEN TO YOU!**
Protect Your Investment With

FlameZel®
Treated by Wenzel
Fire, Water & Mildew Resistant
TARPAULINS

FlameZel Tarpaulins meet the fire resistant requirements of Federal Specifications CCC-D-746. Manufactured under Wenzel Patents No. 2286744, No. 2436216, No. 2463983 and others.

Section showing
Rope Bound
Edges.
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**EXTRA STRENGTH AT
NO EXTRA COST!**

Now all FlameZel Tarpaulins and Windbreaks are equipped with heavy duty rope bound in edges all around. Prevents rips and tears from starting; grommets won't pull out.

FlameZel Tarpaulins and Windbreaks available for IMMEDIATE DELIVERY from distributors in all principal cities. Mfd. by H. Wenzel Tent & Duck Co., St. Louis 4, Mo.



The Hyster 6,000-pound Model KA-60.

Two Lift Trucks

Two new fork-lift trucks have been announced by the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore. The 8,000 and 6,000-pound-capacity models are gasoline-engine-powered and mounted on pneumatic tires.

The 8,000-pound ZA-80 can be operated efficiently indoors as well as out, the company says. Features include short over-all length, long wheel-

base and good weight distribution.

The XA-60 is a 6,000-pound capacity version of the ZA-80 but has shorter wheelbase, width, and over-all length. Both trucks feature a clutch that can be completely removed or installed in less than an hour, and large heavy-duty disk-type industrial brakes.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 112.

Turnpike Accident Study

The Pennsylvania Turnpike Commission has begun a research project to investigate the causes of vehicular accidents on the Turnpike and to determine the extent of apparatus, systems, or techniques required to meet the traffic safety problem. Working with the Commission are Union Switch & Signal, a division of Westinghouse Air Brake Co., Swissvale, Pa., and J. E. Greiner Co., Baltimore, Md., Consulting Engineer to the Commission.

Union Switch & Signal is well

qualified for the project because of its many years of intensive experience in studying, appraising, and solving traffic problems in all their aspects, including that of human reactions. The firm's studies and the resulting controls have covered most of the major lines that make up the nation's railroad systems. With its achievements in safely obtaining maximum efficiency and capacity of railroads, Union Switch & Signal should be able to solve the superhighway problem without sacrificing the time-saving advantages that account for much of the popularity and necessity of such roads. The company will be helped by another division of Westinghouse Air Brake Co.—Welpar, Inc., which specializes in electronics.

The Joint Highway Safety Research Group is the answer to Governor John Fine's demand for remedial action to prevent the superhighway from becoming what he termed "nightmare avenue." The death toll has reached 59 in the 11 years since the first 160-mile stretch was opened.

Bob Moses—Builder

Though neither architect, engineer, nor contractor, Robert Moses of New York City may well be rated as one of the greatest builders in modern America. While trained in the legal profession, he is associated more with blueprints than briefs, and is more concerned with structures of steel and concrete than with torts and equity. Much has been written about this man of many jobs, but in "Robert Moses: Builder for Democracy" one finally gets the complete story in a 356-page biography by Cleveland Rodgers. Complete, we will hasten to add, only up to his 64th year, for hardly had the first copies rolled off the presses when Moses announced he was ready to begin construction of a \$20,000,000 convention hall at Columbus Circle in Manhattan. And to show he is still no great respecter of persons, Moses at the same time was vehemently criticizing the Mayor's Committee on Management Survey for taking three years and \$2,500,000 to produce what he called "a secondhand manual of dated efficiency engineering".

No one will ever get all of Bob Moses between the covers of one book, but Mr. Rodgers has accomplished a painstaking task in this candid presentation of an amazing and unpredictable subject. Mr. Moses has had his hands in many diverse projects since he began his apprenticeship as a public servant at the age of 25 with B. A. M. A., and Ph.D. after his name. The degrees were obtained from Yale, Oxford (England), and Columbia in that order.

Biographer Rodgers has done an exhaustive job of research in collecting his material, and he writes in a smooth-flowing readable manner. This was not easy when dealing with a man who holds down nine official positions in city and state. There has been some overlapping in a few of the chapters, but that is to be expected in keeping up with Moses as he jumps from parks, to slum clearances, to planning, to bridges, to parkways, to airports, to advising on public works in South American Republics, ad infinitum.

He is only paid for one position—Commissioner, New York City Department of Parks, a post he has held since 1934 under the Republican LaGuardia, the Democrat O'Dwyer, and the Independent Impellitteri. Moses calls himself a progressive middle-of-the-road Republican. Once he was persuaded to run for Governor of New York State, but was defeated in a Democratic landslide that swept the country in 1934. He had many run-ins with fiery Fiorello, but the late Mayor and the Park Commissioner always patched things up.

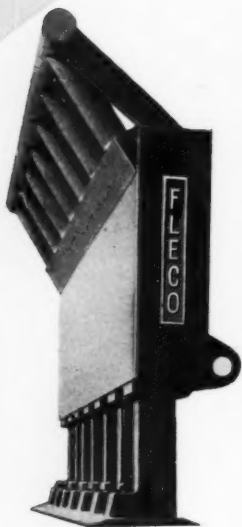
Moses' greatest feud was with Franklin D. Roosevelt, the most powerful opponent he ever encountered. Roosevelt once wanted Moses, in his capacity as chairman of the State Council of Parks, to appoint Louis M. Howe, a newspaper man, to a \$5,000-a-year job as Secretary of the Taconic State Park Commission. Moses did not object, until he found out that Howe was to be an absentee secretary in order to devote all his time to furthering FDR's political ambitions. Moses told Roosevelt that he would not use state funds for that purpose and that FDR should pay Howe out of his own pocket. Roosevelt never forgot or forgave Moses' independence and later tried to oust him as head of the Triborough Bridge Authority. This episode, involving also Secretary of the Interior Harold L. Ickes and Mayor LaGuardia, has probably never been set down so completely before as it now is by Mr. Rodgers, a city planner himself and a former editor of the Brooklyn Eagle.

The massive Triborough Bridge in New York is only one of many great

Announcing ...

THE NEW FLECO TREE CUTTER

Reg. U.S. Pat. Off.



IDEAL FOR . . .
Reservoir Clearing
Pasture Establishment
Road Rights of Way
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Other FLECO PRODUCTS . . .
Rock Rake, Root Rake, Detachable Stumper,
Brush Rake, Pull-Type Stumper, Treedozer,
Undercutter . . . and Accessories . . .



The new FLECO TREE CUTTER is designed for operations where it is not necessary to remove the stump from the ground. Trees and stumps up to 14 inches in diameter can be cut off quickly, efficiently and economically with the FLECO TREE CUTTER.

It can be mounted on either the Angling or Straight Bulldozer Arrangement where the blade is detachable.

Sold by
FLECO - "CATERPILLAR"
Dealers all over the
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FLECO CORPORATION

Jacksonville 3, Florida, U.S.A.

public works for which Moses was responsible or for which he can take credit. Perhaps his greatest ability is that of coordinator. One of his current job titles — Construction Coordinator — sums up best the function Moses handles so expertly. The book contains numerous examples of how he pushed through his diverse projects despite tough opposition. Jones Beach, the Long Island Parkways, the great system of New York State parks were not easily attained.

He has had his setbacks, of course. And they are well defined to annoy his antagonists if they care to look. A glance at a map or a view from the air shows clearly that Wards Island rather than Randalls Island would have been preferable for the Triborough Bridge connection to Manhattan. Moses wanted Wards Island but he was overruled. The big bulge in the alignment of Northern State Parkway is another example of how local landowners in Nassau County forced Moses to shift his plan so that his opponents would not be inconvenienced.

Mr. Rodgers writes that with the exception of the parkway bulge, Moses has won all his many battles on Long Island. He really lost a more important one in 1929 when the New York City Comptroller could not see the need for the six lanes that Moses insisted should be built into Grand Central Parkway through Queens. Anyone who has crept along the present four-lane parkway, where it is too late now to acquire a wider right-of-way, wishes heartily that Moses had been given the extra strip of land he wanted.

But Robert Moses usually gets what he goes after. And his activities are far from being confined to New York City and State. He is actually a consultant to the world at large. Although the New Deal administration spurned Moses' talents throughout the war, he coordinated surveys of congested war-production areas. Later he turned in a report on postwar Germany that was suppressed because of its frankness. Recently he has made surveys and reports on many major cities in this and other countries recommending improvements and public works.

A few years ago The Moles, a society of civil engineers and heavy-construction men, gave recognition to the great works of Moses by making him an honorary member of their organization.

Moses is to New York and this country what George Haussmann was to Paris in the 1800's. The French statesman made Paris what it is today by widening the streets and laying out boulevards and parks. But Haussmann, working for Napoleon III, had only one master, while Moses, working for a democracy, must serve all the people. The frugal French made Haussmann a baron, but then ousted him for spending \$175,000,000 to improve the appearance of Paris. Between 1924 and 1952 Moses has had a hand in construction — public, semipublic, and private — totaling around \$2,000,000,000. From the people he gets grateful thanks for his service, and a \$25,000 annual salary as Park Commissioner.

The book is recommended reading for all who are concerned with construction at any level. It shows what can be done by honest hard-working public officials who are not afraid of opposition.

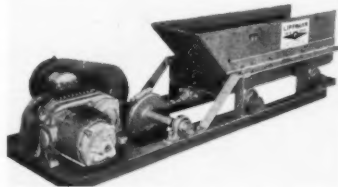
Published by Henry Holt & Co., 383 Madison Ave., New York 17, N. Y., "Robert Moses: Builder for Democracy" sells for \$6.00.

ASTM Elects Secretaries

Robert J. Painter has been elected Executive Secretary of the American Society for Testing Materials, Philadelphia, Pa. Raymond E. Hess is Associate Executive Secretary and Editor in Chief. Mr. Painter, former Treasurer and Assistant Secretary, succeeds the late C. L. Warwick.

A New Plate Feeder

A new 20-inch x 5-foot reciprocating plate feeder run entirely on ball bearings has been developed by Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis. It has



a babbitt-lined eccentric drive for easy adjustment and replacement. It is driven

by a 3-hp variable-speed electric-motor gear reducer with belt drive operating over adjustable pitch sheaves.

The operator can adjust the dial at the rear of the unit for finer feed control of pit-run material for excessive varying deposits. The finer the pit-fed material, the faster the operator sets the feed. A completely enclosed oil-lubricated chain drive transmits power to the eccentric shaft from the speed reducer.

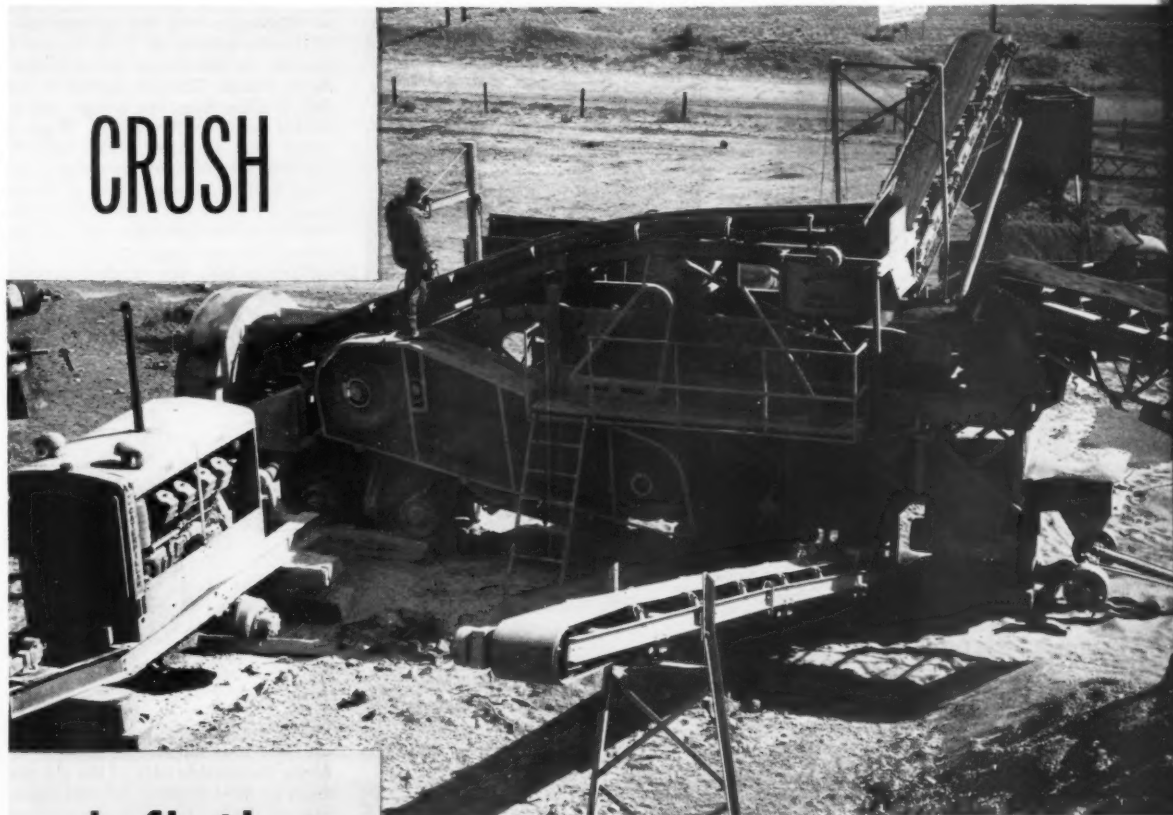
Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 118.

Hewitt-Robins Expands

Hewitt-Robins Inc., recently dedicated a \$1,000,000 addition to the com-

pany's conveyor-belt plant in Stamford, Conn. The new facilities increase the company's conveyor-belt production capacity by 41 per cent, and make the plant one of the largest and most modern in the world. New equipment includes a \$220,000 press, which will make belts up to 72 inches wide as compared with the previous limit of 60 inches.

More than 2,000 employees and public officials, along with the firm's top management, attended the open house and dedication on October 25. The program consisted of speeches, the unveiling of a plaque, a tour of the industrial-rubber-products plant, and refreshments. Among the speakers was Thomas Robins, Sr., who invented the troughed-conveyor belt in 1891 and sold his first one to Thomas A. Edison.



CRUSH
inflation
out of
your
dollars

Budget-minded "Caterpillar" Diesel Engines deliver 100 cents in work for every \$1 worth of fuel. Compare your fuel costs with those of Schmidt Construction Co., Grand Junction, Colo., building U. S. Highway 85-87 north of Pueblo.

The company reports that its "Cat" D17000 Engine is producing power to crush 3,350 tons of material per day for only \$6.40 worth of fuel. That's more than five tons per penny! The money-saving Diesel is the heart of a Master Tandem Cedarapids Crushing Plant.

Same tonnage is being handled by the "Caterpillar" D13000 Diesel Engine that powers the company's Bucyrus-Erie Shovel. Fuel cost: 64 cents an hour.

Strong-arm "Caterpillar" Diesel Engines are a two-way hedge against cost-boosting inflation. Available up to 500 horsepower, they burn low-cost, non-premium fuel — and they do it without fouling! And they slash expensive maintenance costs because they are quality built for a long, productive life.

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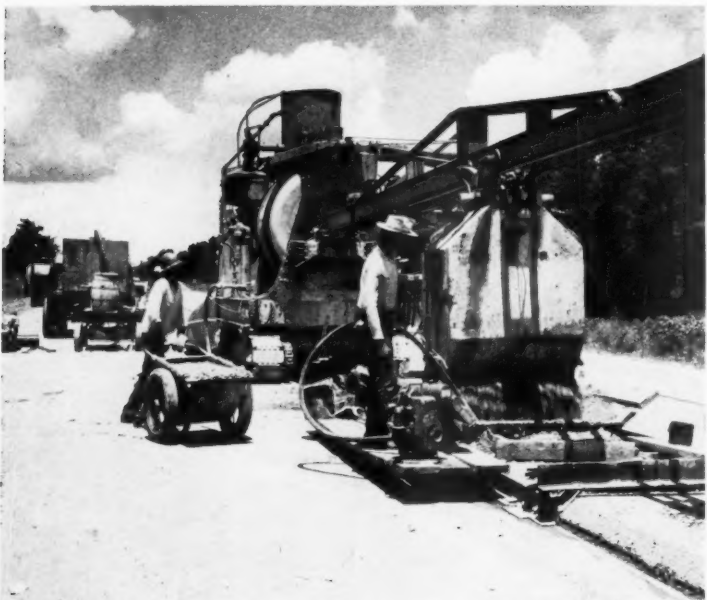
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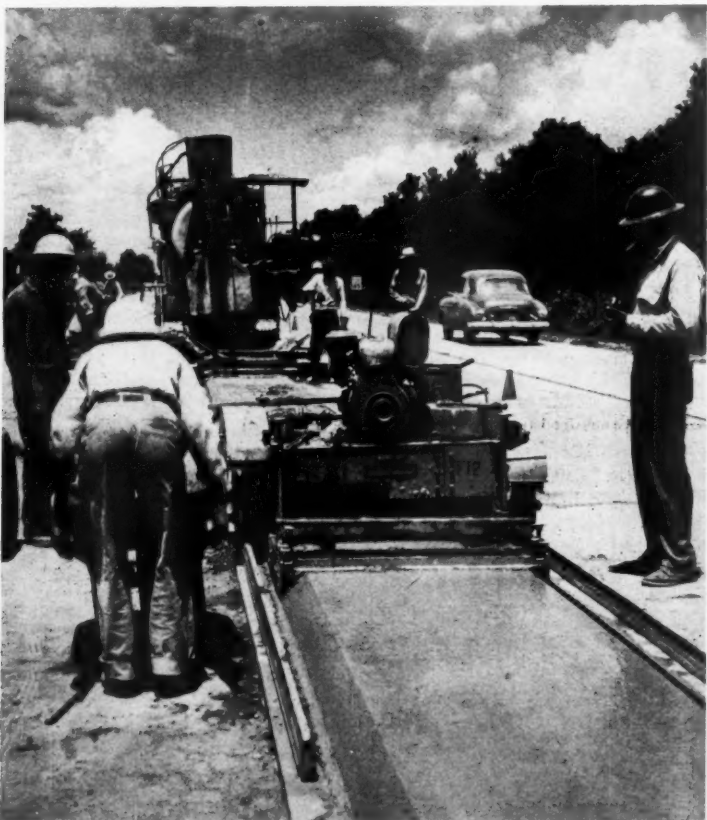
DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



The Blaw-Knox batch plant is set up in the middle of a sugar-cane field. A Koehring 304 with a $\frac{3}{4}$ -yard Owen clam loads sand from the stockpile into the aggregate bin.



Koehring paver discharges concrete into strikeoff box that straddles the median strip and is pulled along by the paver. A Master vibrator vibrates the concrete.



Following right behind is the Dotmar curb-and-gutter paver moving on special rails. It is traveled at about 8 feet per minute and paved up to 3,200 feet per day.

Machine Paves Median Strip Without Forms

New Concrete Pavement and Median Converts Louisiana Road Into First-Class Divided Highway

By WILLIAM H. QUIRK
Editor

• ONE of the several over-a-million-dollar projects on the 1952 construction program of the Louisiana Department of Highways was the paving of an 11.17-mile stretch on U. S. 71 and 190 west of the Mississippi River bridge at Baton Rouge. The job started at Lobdell, 3 miles from the bridge, and extended west to Erwinville. Work got under way in April, 1951, after the Highway Department awarded a contract to T. L. James & Co. of Ruston, La., on its low bid of \$1,155,161. Final touches on the new highway were completed this past August.

Built in 1932, the existing pavement consisted of a 20-foot reinforced-concrete slab with an 8-7-8-inch cross section. Heavy traffic on this important east-west artery influenced the highway engineers to add another two lanes to the original concrete, separating the old from the new by a 4-foot raised median strip. No right-of-way was required for the new project. Thus east-bound traffic uses the new pavement, while west-bound traffic drives on the old concrete that is now part of the four-lane divided highway.

The pavement on the new half of the road is 24 feet wide, of plain concrete with a 9-7-9-inch cross section. The change in thickness comes 3 feet 9 inches from edges. The slab has a tangent crown of $\frac{3}{16}$ inch to the foot to the outer edge, and is flanked on the outside by 7-foot shoulders sloping at the rate of 1 inch per foot. Slopes at the side are not steeper than 4 to 1. Along the outside edge of the old pavement an 11-foot shoulder was built as part of the contract. This rather wide shoulder was put in so that in the future the original pavement may be widened from 20 to 24 feet, and still leave a 7-foot shoulder as on the other side of the divided highway.

Structures Widened

All pipe culverts and structures also had to be widened in this contract. The extension of these drainage works on both sides was one of the first moves of the contractor. At the time the origi-

nal roadway was graded, provision had been made for two 20-foot lanes with a 1-foot median strip, and the bridge had been built with a 40-foot roadway. Now, however, the bridges were widened to a 66-foot roadway, and the 4-foot median was continued right across the structures.

Grading

In the first few months of the contract the only work that was possible was on the structures. Because of the high-water stages on the Mississippi River, no grading could be done, since all the material needed for the roadway came from riverside pits along the Mississippi bottom. No select material had been placed under the original concrete pavement, but specifications for the new work required the concrete to be laid on suitable material. Consequently, some 8 miles of this job was undercut about 6 inches and replaced with select material from the riverside borrow pits. This select material is classified as A-4 or better, with a plasticity index of not more than 12.

Three different borrow pits were opened up to provide material both for the embankments and the selected subgrade treatment. Average height of the embankment on the road is about 3 feet. Not until August, 1951, did the river go down enough for the men and equipment to work in the borrow pits. A pair of Koehring 304 draglines and an Insley dragline, all with 35-foot booms and 1-yard Hendrix buckets, excavated in the pits, loading out to a fleet of trucks that ranged from 15 to 8 in number; most of them held 4 yards. T. L. James also employed a Doman elevating grader, mounted on a Caterpillar No. 12, to speed up the work when the weather and the low river stage permitted intensive operations in the pits. For cleanup work the contractor used either Caterpillar D7 or International TD-18 dozers. Average haul from the batture pits with the silty sand material was 7 miles.

Borrow hauling started in August, and the material was always fairly well so that it compacted well on the embankment. A pair of Caterpillar No. 12 motor graders spread the material.

C. & E. M. Photos



The final operation is curing. Workman applies Hunt Process from a spray pump powered by a Briggs & Stratton engine. Traffic cones keep vehicles away from work.

which was compacted with sheepfoot rollers pulled by D4 tractors. A 95-100 per cent density was obtained without any difficulty.

Batch Plant

While the grading was going on, the contractor proceeded to set up his concrete batch plant. He located it on a siding of the Texas and Pacific Railway, about 3 miles from the east end of the project and 1/2 mile north of the highway. About 100 yards apart along a haul road he erected a Blaw-Knox 3-compartment 60-yard aggregate bin and a Blaw-Knox 150-barrel cement bin. All material came by rail. The sand and gravel aggregate was supplied by the Holloway Gravel Co., of Cole, La., 14 miles from the site. The material was unloaded by a Koehring 304 crane equipped with a 40-foot boom and an Owen 3/4-yard clamshell bucket, which either stockpiled the sand and gravel or loaded it directly into the hopper bins.

Ideal Cement Co., of Baton Rouge, supplied bulk cement for the job, shipping it to a siding on the east side of the Mississippi River, whence it was hauled to the batch plant in covered trucks. About one-third of the cement was delivered in hopper-bottom cars, from which it was transferred to a storage bin by the conventional worm-gear and enclosed-bucket elevator. But, as hopper cars were scarce, the remaining two-thirds of the cement came in boxcars. Hough 1-yard Payloaders were used to transfer the cement from the boxcars into the trucks that hauled it to the job site.

From 14 to 30 trucks, holding two batches each, hauled the dry concrete from the plant, first backing under the aggregate bin and then passing under the cement bin on the way out to the highway. A maximum of 30 trucks may seem high for the length of the job, but traffic was usually very heavy on this road and the trucks were slowed up considerably. The contractor preferred to have extra trucks at times rather than to keep the paver waiting for material.

The Mix

For the concrete paving, the mix was 1:1.85:3.15, and the weights of a typical 8-bag batch were as follows:

Cement	752 lbs.
Sand	1,628 lbs.
Gravel	2,570 lbs.
Water (5 gal./bag)	40 gals.

Water for the concrete was pumped from local drainage canals into tank trucks, which hauled the water to the paver. Trucks included one 3,000-gallon tank truck, and two 1,500-gallon tank trucks. A 4-inch pump was used at the canals.

The gradation of the sand and gravel used in the concrete is given in the following tabulation:

Sieve Size	Per Cent Gravel B	Per Cent Passing Sand
2 in.	100	....
1 1/2 in.	85-100	....
3/4 in.	40-85	....
3/8 in.	....	100
No. 4	0-5	95-100
No. 16	....	65-90
No. 50	....	7-30
No. 100	....	not more than 7

On the Road

On the highway the contractor supplied himself with 10,000 linear feet of Heltzel forms, and set them in place after the fine-grading had been done with a Caterpillar No. 12 motor grader. Trenches for the forms were dug with a Cleveland Formgrader, and the pins were driven by hand.

Expansion joints were laid out every 120 feet while the transverse contraction joints were spaced 30 feet on centers. Expansion joints consisted of a 3/4-inch thickness of redwood that came up to within 3/4 inch of the top of the slab. For the contraction joints a 3/4 x 2-inch strip of redwood was placed transversely across the subgrade. Texas Foundries supplied Star Lug D14



C. & E. M. Photo
An Insley dragline with a 1-yard Hendrix bucket loads a Dodge truck from one of three borrow pits on the batture along the banks of the Mississippi.

dummy joints and D13 expansion joints. Dowels were spaced on 17-inch centers.

Since the paver, a Koehring 34-E Twinbatch with a 25-foot boom, worked inside the forms, the joints were placed after the paver had passed, and before the concrete was placed. Immediately behind the paver came a planer to cut the subgrade exactly, and also a scratch template to check the depth.

Paving Operations

Twin batches were mixed a total of 67 seconds, and then the concrete was deposited between the forms in front of a Jaeger-Lakewood two-screed finishing machine. A Flex-Plane machine cut both the transverse and longitudinal center joints and this was followed by a Koehring Longitudinal Finisher. A 6-inch traffic stripe of black magnetic iron was put down the middle of the pavement, and the concrete was cured with Hunt Process compound applied from a Flex-Plane machine. All joints

(Concluded on next page)

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Median Strip Paved Without Face Forms

(Continued from preceding page)

were later poured with asphalt mineral filler.

Paving started at the eastern end of the job and continued through to the western. The first concrete was laid on January 21 of this year and work was carried on throughout the winter. The free-flowing base course, 6 inches thick, provided good drainage and the weather caused no appreciable inconvenience or stoppage of work. An average of 1,600 linear feet of 24-foot pavement was laid a day. The best performance was on the next-to-last day of work, April 26, when 800 batches were turned out. A total of 1,908 linear feet of pavement was laid in that record 11-hour day.

Traffic was maintained on the existing pavement while the new concrete was being laid. This piece of road is very straight, having a 2-degree curve

at the beginning and a 1-degree 45-minute curve at the end. There are some slight curves in the middle of the job, but altogether there are about 8 miles of tangent. The Missouri Pacific Railroad parallels the highway on the south side.

Median Strip

When the paving was completed, work started on the median strip, which is a comparatively new design in the Louisiana State Highway Department. It is a raised median, 4 feet wide and averaging 6 inches in thickness. The flat top is 3 feet 3 inches in width, with the sides sloping down to the pavement. It was designed so that the new concrete slab should be 2 to 3 inches higher than the existing pavement. This was done to permit future asphaltic-concrete binder and surface courses to be laid over the old pavement. These courses are expected to be 2 and 1½ inches respectively.

The mix for the median concrete is 1:2.15:2.85, and the mixing was done

in a Koehring 27-E single-drum paver equipped with a 25-foot boom. Batches were mixed for 60 seconds. The paver straddled the median strip. Alongside the paver was the tank truck supplying the water. This tank truck pulled a skid on which was mounted a Rex 2-inch pump for feeding water to the paver. A small cart holding a keg of drinking water was also in tow. The paver pulled along a strikeoff box that straddled the median, too. Concrete was dumped into this box, which was 15 feet long and made of steel beams and angles with wooden sides to form a hopper. As the concrete was placed it was vibrated with a Master vibrator. The vibrator was carried along on a platform at the side of the strikeoff.

Machine Speeds Work

Right behind the strikeoff came the Dotmar self-powered curb-and-gutter paver. This machine eliminated the use of face forms and assured compact concrete that was laid at a rapid rate. For this particular job the manufacturer

added the required extensions from conventional 2-foot curb-and-gutter machine, and then shipped it to the contractor, who added the necessary modifications for his particular needs. It moved along at the rate of about 6 feet a minute, and its best performance was the laying of 3,237 linear feet of median strip in an 11-hour day. It moved on rails laid out on base plates that ran along the edges of the pavement. The bases were kept apart the proper distance by spacers anchored in the ground at 10-foot intervals. Straps 2½ inches long fastened to the bottom.

In the back of the paver, a 1:2 grout was added to the surface of the concrete by the hand finishers. This grout was run through the paver and dumped into a grout box, mounted on a skid that was pulled by a water truck. The median concrete was also cured by the Hunt Process, applied with a spray pump powered by a Briggs & Stratton engine.

The median strip had expansion joints at the same interval as the pavement, but the dummy contraction joints consisted only of scoring. The median paving was also done from east to west.

An effort was made to save the many trees along the highway, and altogether 250 tree wells were built around trees rather than move them or cut them down. These tree wells consist of rubble concrete that was set in mortar forming semicircular retaining walls, in the side of the slopes.

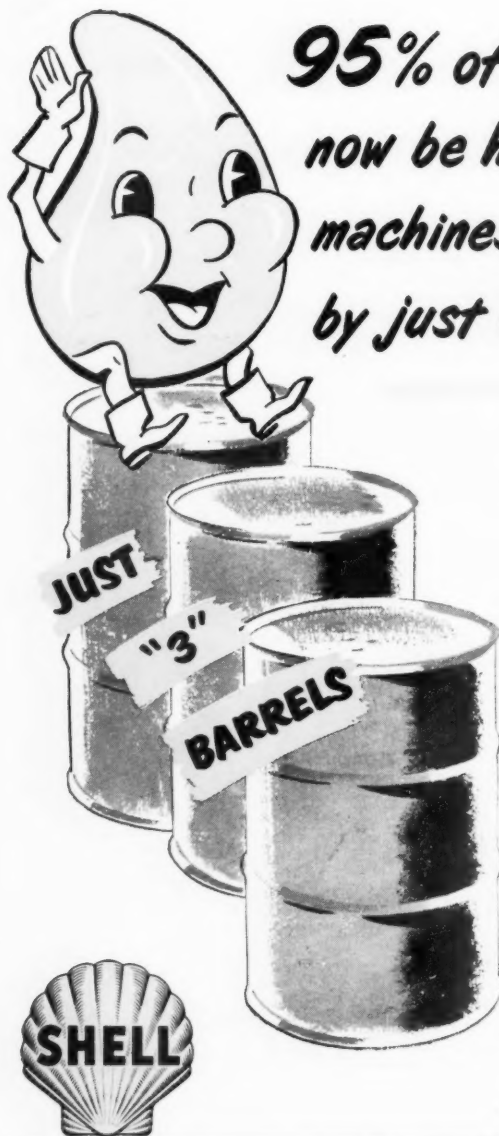
Quantities and Personnel

The major items in this 11.17-mile highway contract consisted of:

Common excavation	56,556 cu. yds.
Borrow excavation	103,910 cu. yds.
Portland-cement pavement	155,376 sq. yds.
Class A concrete	1,355 cu. yds.
Reinforcing steel	242,009 lbs.
16-inch precast concrete piles	3,580 lin. ft.
Concrete median	24,157 sq. yds.

T. L. James & Co., Inc., of Ruston, La., employed an average force of 115 men at the peak of the project. L. H. Hadnot was Project Manager, and H. B. Smith was Concrete Foreman.

For the Louisiana Department of Highways, E. F. Oakley was Project Engineer and Ruffin Jewell was Paving Inspector. The project was located in District 6, of which C. J. Helbak is District Construction Engineer with headquarters at Hammond. The Department is headed by E. J. James, Chief Engineer, with R. H. Vaughan, Construction Engineer.



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By maintaining clean engines and minimizing sludge formation, piston lacquering, ring and valve sticking, and port clogging, Shell Rotella Oil extends periods between overhauls, reduces parts replacement costs, and gives you reduced oil consumption.

†Some manufacturers recommend a straight mineral oil for gear lubrication. Your Shell Lubrication Engineer will suggest the proper lubricant in such cases.

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Write for Bulletin

Rubber-Tired Tractor Has Four-Wheel Drive



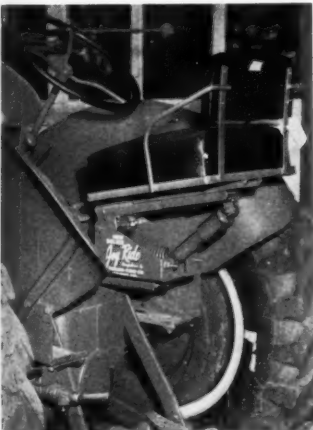
A new 4-wheel-drive tractor is announced by The Frank G. Hough Co., 822 Seventh St., Libertyville, Ill., subsidiary of International Harvester Co., Chicago, Ill. The Model TM Payloader is available with a 106-hp gasoline engine or a 90-hp diesel engine. It weighs 25,000 pounds and develops up to 16,000 and 14,000 pounds drawbar pull, with gasoline and diesel engine respectively. Features include: a full reversing transmission with four gear ratios in both forward and reverse; speeds up to 27 mph; a torque-converter drive in addition to a friction clutch; rear-wheel steer with hydraulic power booster; 16.00 x 24 tires all around; and operator location for fullest visibility.

The Model TM Payloader is recommended for heavy-duty drawbar and pushing work, such as railroad-car switching and spotting. It can pull or push 8-10 loaded cars. The big earth-mover tires walk readily over ties and across tracks to get to the cars by the quickest, shortest route. The torque converter assures precise control for careful spotting and slow steady application of power for starting heavy loads. Compact design and short wheel-base, with sharp-turning radius and power-booster steer, enable this machine to maneuver easily in close quarters.

Further information may be obtained from the company, or by using the Request Card at page 18. Circle No. 152.

Seat Absorbs Shock On Compressor Model

Portable air compressors manufactured by Schramm, Inc., West Chester, Pa., are now equipped with a hydraulic shock-absorbing cushioned seat. The



Joy Rider hydraulic seat includes a number of features for the operator's comfort. A spring-filled cushion and backrest are said to help lessen fatigue. The hydraulic shock absorber softens bumps and jolts. By means of a weight regulator, each operator can adjust the seat's hydraulic action to handle his exact weight.

The Joy Rider seat is made by the Fleischer-Schmid Corp., Columbus, Nebr.

Further information may be secured from Fleischer-Schmid. Or use the Request Card at page 18. Circle No. 197.

Aerial Photography Saves Time, Money for Parkway

Engineers planning the scenic Garden State Parkway in New Jersey are going scientific from start to finish. They have decided to abandon the slow and expensive method of using surveyor parties to comb potential routes and adopt instead the war-proven method of using aerial photographs. The project is headed by Theodore Spawn, Jr., a former artist, who during the last war built miniatures of Japanese islands from photographs.

An aerial survey was the first operation in this intricate job of reducing 180 miles of land to models for study. A 2,000-foot-wide strip (extending from Bergen County to Cape May) was

selected, and two cameras were used simultaneously, with the result that the pictures, when combined, had three-dimensional characteristics. These aerial contour maps provided the necessary information for construction of the model and showed New Jersey Highway Authority engineers where to lay out the expressway in order to take maximum advantage of the terrain.

The actual model construction involves tracing the contours on wall-board, cutting them out like a jigsaw puzzle, and finally placing them together for an exact scale model of the 2,000-foot-wide area "boiled down" to a width of 20 inches. By laying out the highway route with this model as a basis, engineers can plot bridge sites and plan drainage. They can immedi-

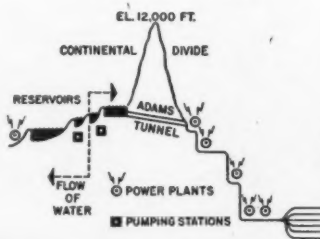
ately ascertain an average elevation for the road bed giving minimum of grade for economy of fuel consumption, and can place curves with a view to safety and economy of distances.

Another wartime technique serves a peaceful purpose.

Public Works Appointment

Samuel B. Ehrenrich has been given a provisional appointment as District Engineer at the Hornell office of the New York State Department of Public Works. Formerly Assistant District Engineer, he has been an employee of the Department almost continuously since 1908. Mr. Ehrenrich succeeds Herman F. Brumm who died in October.

Colorado Big Thompson Project



Here's how water will be tunneled from West to East below the Continental Divide in one of America's spectacular construction projects of today!



ADLER CONSTRUCTION CO., Loveland, Colo., use their Lorain 820-I with a 70 ft. boom to handle concrete buckets on the construction of one of the many concrete structures on the Colorado-Big Thompson Project.

The Colorado-Big Thompson Project is "big" in every way. It's a \$150,000,000 Bureau of Reclamation project, that will gather waters on the west slope of the Continental Divide at the source of the Colorado River, 1-1/2 miles above sea level. Water will be transferred through a 13.1 mile long tunnel beneath the Divide to the eastern slope, to feed irrigation systems in north-eastern Colorado. The entire job involves 47 million yards of embankment and excavation, 15 dams, 7 dikes, 10 reservoirs, 24 tunnels, 6 power plants, plus a multitude of pumping stations, canals, siphons and other construction projects. On this mammoth job you will find practically every kind of construction, every kind of material handling, every kind of material to be moved! Contractors on this huge project are using

many Lorains . . . as shovels, draglines, cranes . . . on crawler and rubber tire mountings.

Big jobs like this one are made up of many individual operations . . . and that is an important reason why Lorain selection unlimited can best fill the needs of contractors — large or small. There are shovel sizes from 1/2 to 2-yd. classes . . . crane capacities up to 45-tons . . . plus the world's most complete selection of mounting types to suit every working condition.

Big jobs—or small—it will be well worth your while to present every shovel-crane problem to your nearby Thew-Lorain Distributor. He can help you make more money on every bid.

THE THEW SHOVEL CO., LORAIN, OHIO

WINSTON BROS., St. Paul, Minn., have a \$10 million dollar contract. They don't gamble with performance—this Lorain 50-I dragline with 1 yd. bucket is shown working on a 3-1/2 mile section of a feeder canal.

WINSTON BROS. make a quick switch with their Lorain 50-I. Here the "50" is converted to a 1-yd. shovel to handle fast grading. The same machine does two jobs, by a simple front-end change.

A 25-ton Lorain Moto-Crane, Model MC-504W, is another important unit in the WINSTON BROS. fleet. It highballs on the job at 30 m.p.h. speeds. Here, it is shown setting a 4750 lb. I-beam for storage tank construction.

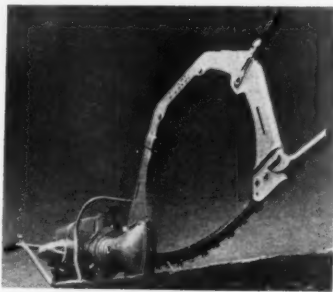


T H E W - L O R A I N

Free-Flow Bow Saw

A new free-flow bow saw is announced by Henry Disston & Sons, Inc., Philadelphia 35, Pa. The 9-hp unit has a 25-inch bite and can cut at a rate of about 1 inch a second on 17-inch seasoned beech logs.

Free-flow comprises an important variation in the chain action, and is said to speed cutting and reduce friction. Instead of riding around the groove of a continuous steel rail, the new bow chain, after traveling the 25-inch span of the bite, is carried inside the bow casting on four ball-bearing idlers. One idler acts as a tensioning point controlled from a rubber grip



handle high on the bow frame, which turns easily to increase or decrease the tension of the chain. Another lower

handle, for two-man operation, folds against the frame, permitting one man to buck close-lying logs. The cutting principle of the new bow allows the teeth to ride a groove in a 2-inch-wide guide rail. The center of the rail is open. The log pinches itself but not the rail or upper chain travel. The unit is powered by a Mercury gasoline engine.

The saw's angular shape gives extra strength and balance, and the free-flow principle permits the chain to be slipped on or off the idlers in a few seconds, eliminating the need to remove parts or use special tools, Disston reports.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 107.

Flexicore Made in Alabama

Flexicore precast-concrete slabs for floor and roof construction are being manufactured in Alabama for the first time. Last September, Alabama Cement Tile Co., of Birmingham, began production, with Allan Wingo as Manager of Alabama's new Flexicore Division. The new branch will provide a convenient supply source for southern architects, engineers, and contractors. It is believed that the newly expanded facilities in the company's Birmingham plant (which produces 8 x 16-inch cross-section slabs in lengths up to 26 feet 11 inches) will allow annual production of 200,000 square feet of precast slabs.

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USER: The John T. Dyer Quarry Co., Birdsboro, Pa., producers of trap rock.

INSTALLATION: GM 4-71 Diesels powering 11 Koehring Dumpsters. Six purchased in 1946, three more in 1948 and two in 1950. Dumpsters gradually replaced railroad as quarry deepened and haul grades became too steep.

PERFORMANCE: Dumpsters keep crusher operating at peak capacity 10 hours a day. Easily negotiate 7% grade with 7½-ton load on 1400' haul. Engines have operated dependably with time out only for normal maintenance.



THIS DIESEL GETS UP GRADES FASTER

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Greater payload capacity is a feature of Cook Bros.'s new dump truck.

New Dump-Truck Model

Production of a new 15-ton-capacity dump truck has been announced by Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles, Calif. Features are greater payload capacity and easy maneuverability on the highway and on the job.

To increase total legal payload capacity, greater advantage has been taken of the load-carrying ability of the front axle, by shifting a portion of the payload weight to the front. A heavy-duty front axle has been provided to absorb this greater weight. The chassis is built of high-quality-steel members, braced to support a maximum load. All component parts of engine, steering mechanism, axles, transmissions, and drive units are said to be easily maintained and readily replaced from stocks available at local parts dealers.

The Ford 317 V-8 155-hp engine is accessible for service and repair by elevating the one-piece steel hood. The purchaser may specify either a dual-gear drive, dual-center-chain drive, or double-reduction axle with third-axle attachment, according to requirements. The single-passenger cab provides unobstructed view. A quickly adjustable hydraulically suspended seat, oversize steering wheel (power steering is optional), easy-to-read instruments, and many other features combine to make driving easier, safer, and more efficient, the company points out.

The wheelbase length is 174 inches. Brakes are full air. The truck also has a hydraulically powered telescopic hoist.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 177.

Tips on Road Maintenance

A 36-page booklet entitled "Maintenance Tips for Unpaved Roads" has been prepared by the Calcium Chloride Institute, 909 Ring Bldg., 18th & M Sts., N. W., Washington 6, D. C.

It contains illustrations and helpful procedures for application of calcium chloride and maintenance of roads in all seasons. The booklet includes tables, and lists 20 pertinent questions on maintenance procedures with answers based on practical field experience.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 110.

Legal Guide Book

Contractors, architects, and engineers who run into legal problems in their work may save themselves some awkward situations, and possibly litigation, by a study of "Legal Guide for Contractors, Architects, and Engineers", by I. Vernon Werbin, published by McGraw-Hill Book Co., Inc. Though not intended to take the place of necessary legal services, this book—the second of its kind by Mr. Werbin, and written to be easily understandable by the layman—sets out to warn its readers of common pitfalls in the construction field. The

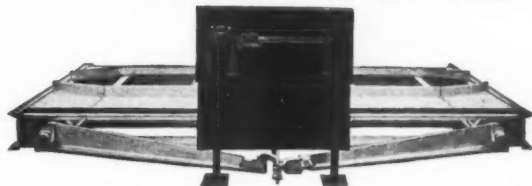
author, a professional engineer as well as a practicing attorney, describes 83 situations of the sort that frequently lead to litigation, and tells how the courts viewed each case. Error in bid, breach of contract, change of contract, failure of performance, waiver of spex

requirements are just some of the situations covered. A table of cases and an index by subject are included.

"Legal Guide for Contractors, Archi-

ects, and Engineers" is available from the publisher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. Its price is \$4.75.

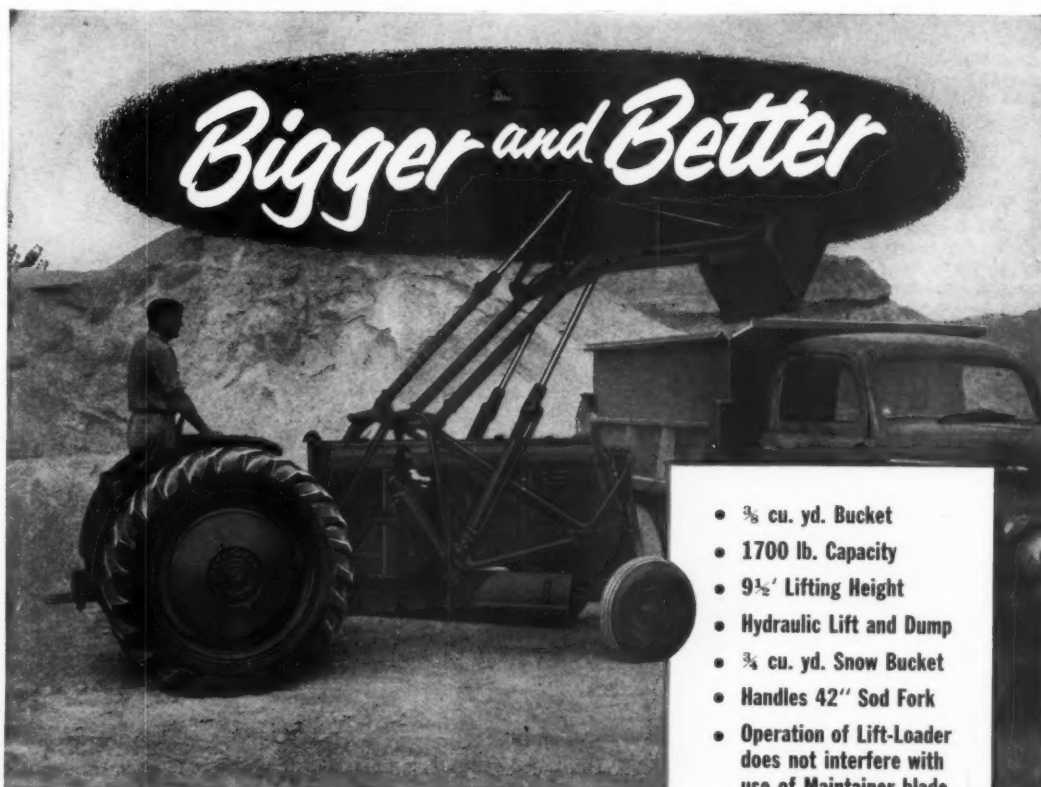
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Navy Extends Runway To 14,300 Feet

Long Strip Needed for Jet Testing at Patuxent Air Station;
Current Construction Also Includes Hydraulic Catapult

By WILLIAM H. QUIRK
Editor

• ALTHOUGH not quite ten years old, the U. S. Naval Air Station at Patuxent, Md., is one of the largest air experimental stations in the world. And when the current runway is completed, the Navy will probably have the longest runway—14,300 feet—to be found anywhere. NAS Patuxent River was commissioned in April, 1943, to act (1) as an aviation-test center, and (2) as the East Coast terminal for the Naval Air Transport Service. In June, 1945, the station was redesignated Naval Air Test Center (NATC) Patuxent River, with the air station as a subordinate command.

Located about 60 miles southeast of Washington, the 6,000-acre reservation occupies the south bank of the Patuxent River where it enters Chesapeake Bay in St. Mary's County, Md. About half the area was woodland and the rest was farmland when the U. S. Navy took over the tract during World War II. The Civil Engineer Corps of the Bureau of Yards and Docks built a great land and seaplane air base on the site within 18 months.

Aircraft-landing facilities include four concrete runways; four concrete seaplane ramps; together with taxiways, aprons, and warm-up platforms. Three of the runways are 300 feet wide, with the following lengths (designations are derived from compass bearings): 13-31—9,700 feet; 2-20—6,410 feet; 6-24—6,400 feet. The fourth runway, 9-27, is 6,690 feet long x 150 feet wide.

In addition to the runways, there are 38,895 feet of 100-foot paved taxiways on the field, and 549,920 square yards of concrete aircraft-parking area. Each of the seaplane ramps measures 95 x 250 feet.

Not Long Enough

While the 9,700-foot runway, longest existing facility at the station, was satisfactory for ordinary operational use, it was not considered adequate for aircraft tests, especially for jets. Aircraft being tried out at the Test Center are relatively new, and consequently there is a comparatively high percentage of abortive takeoffs and landings. In recent months test aircraft have been lost at a material cost to the Navy of over \$1,000,000. In each case the accident could have been avoided had there been a runway of sufficient length to permit recovery after, in one case, an unsuccessful takeoff, and in the other, an emergency high-speed landing. If this situation continued, the financial loss resulting from aircraft accidents, plus the incalculable value of the lives of crew members, would far exceed the cost of any runway extension.

It was impossible to extend the 9,700-foot runway, since its ends came close to the Patuxent River on one side and Chesapeake Bay on the other. Runway 6-24, however, with its 6,400-foot length, was well placed for an extension at its northeasterly extremity. So the Navy awarded a contract to the Williams Construction Co., of Baltimore, Md., for an additional 7,900 feet of runway, 300 feet wide, thus giving the big base a 14,300-foot runway.

Work on this \$2,282,879 project began in August, 1952, and is scheduled for completion next October. The contract includes removal of topsoil, excavation, fill, and stabilization of subbase, instal-

lation of necessary drainage facilities, paving of 10 inches of concrete over 2,370,000 square feet, and construction of a 10-inch-thick taxiway along the north side of the extension, 100 feet wide x 9,200 feet long.

Concrete Pavement

With the exception of one taxiway of flexible-type construction, all the plane-traffic facilities at Patuxent have concrete pavements. Portions of the warm-up aprons at two hangars are of reinforced-concrete construction, but plain

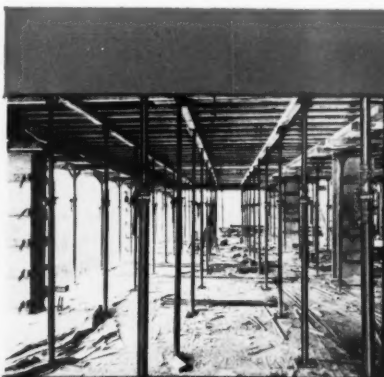


Official U.S. Navy Photo

A Euclid loader pulled by a Caterpillar D8 strips the topsoil from a runway-extension site at NATC Patuxent River, Md. Williams Construction Co., Baltimore, is the contractor on the project.

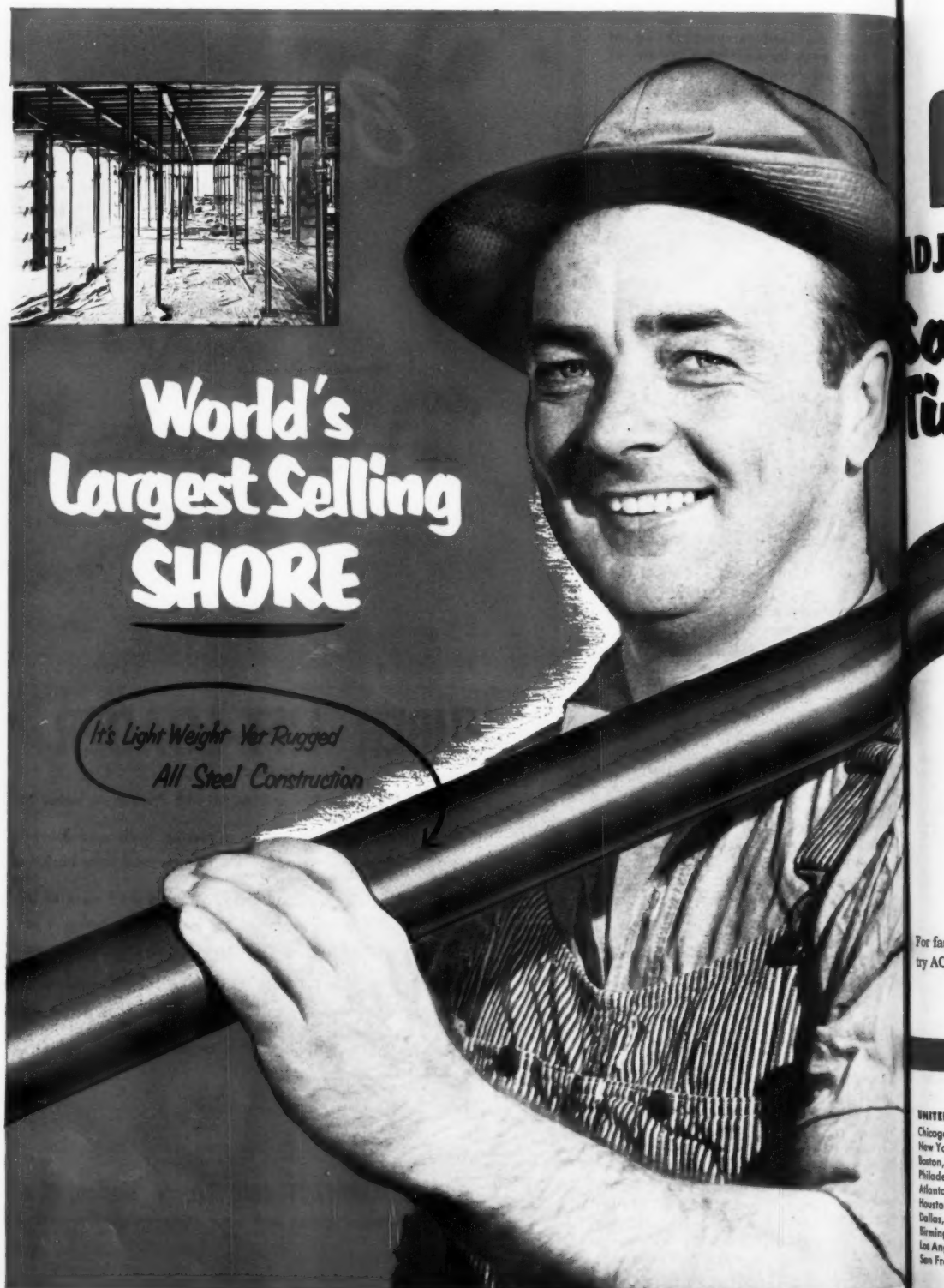
concrete is used in the runways. The original 6,400-foot part of runway 6-24 is 8 inches thick throughout, with contraction joints on 20-foot centers and expansion joints on 60-foot centers.

Transverse expansion joints are dowelled, with the dowels placed on 1-foot centers. Alternate longitudinal expansion joints are also dowelled. The new 10-inch concrete pavement for the ex-



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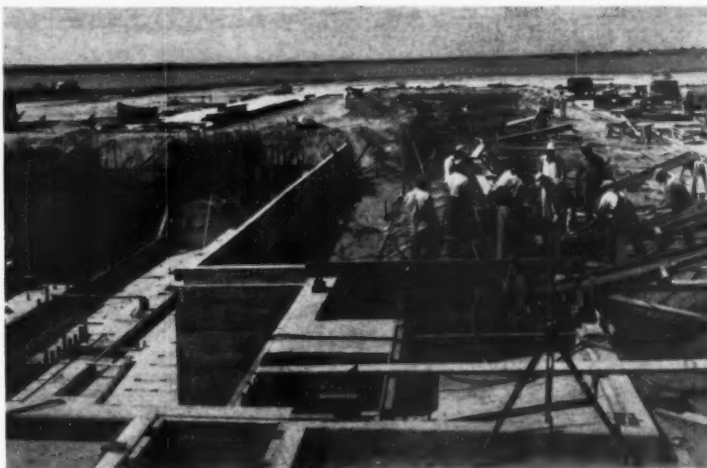
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tension will be reinforced only at the end of the runway.

One of the first moves of the contractor was to strip off the topsoil and stockpile it at least 750 feet from the edge of the future paving. Stripping was done with a Euclid loader pulled by a Caterpillar D8 tractor, while a fleet of bottom-dump Euclids hauled the material. About 600,000 yards of loamy soil was removed in this manner. Cut and fill for grading the extension totaled about half a million yards. The ground at the site is generally flat, and most of the new work is in cut, the highest fill being only a 6-foot embankment. A few muck pockets were encountered, and these were removed and backfilled with suitable material.

At the far end of the extension near the bay, the water table is only a few feet below ground level. In the higher areas, however, water is as much as 15 to 25 feet below the surface. The site is fairly well drained, with moderately permeable underlying sediment. All of the rigid-type concrete pavement is



Official U.S. Navy Photo

Another piece of construction at NATC Patuxent River is a hydraulic-type catapault for launching aircraft. The contractor for this job is Ayers-Hagan & Booth, Inc., Providence, R. I. Workmen pour concrete for the plane track—eventually to be the only visible part of the catapault.

laid on a sand and clay subbase that is stabilized to 98 per cent. Since the climate in this part of Maryland is mild in the winter, with only about $\frac{1}{2}$ inch of frost in the ground, the contractor is expected to carry on his operations so as to start paving early in 1953. With favorable weather the actual paving may be finished by late summer.

Materials Problem

Because of the heavier and faster-landing new planes with the emphasis on jets, the runway extension is designed to take a 50,000-pound single-wheel load or a 240,000-pound plane. The plain concrete, which will be air-entrained, must have a flexural stress of 700 pounds. These specifications pose something of a problem in obtaining suitable aggregate for the concrete, since no materials are available locally. The station is also somewhat remote from sources of supply, although a 45-mile spur track connects the site with the Pennsylvania Railroad at Brandywine, Md.

In his pre-paving planning the contractor expects to use slag for the coarse aggregate, and ship this material by barge from Baltimore, Md., down Chesapeake Bay to a station dock on the Patuxent. A batch plant will be set up at a mid-point of the extension. Froehling & Robinson, Consulting Engineers, Richmond, Va., will design the mix to be used.

The extension of the runway cuts through the station golf course, and requires the removal of some buildings and the relocation of Cedar Point Road that runs out to the shore of the bay. The relocation will take the form of a perimeter road around the northeastern boundary of the tract, keeping close to the shoreline of the river and the bay. It will have a 2-inch asphaltic-concrete pavement, 24 feet wide. Two bridges are required to carry the perimeter road over creeks at the estuary; one is only a 60-foot structure, but the other has a span of 2,100 feet.

Other Contract

Because of the need for constructing the perimeter road and bridges while the runway is being extended, the road and bridge items are being handled by another contractor—Ayers-Hagan & Booth, Inc., of Providence, R. I. This firm was already on the site with a \$1,096,000 contract for construction of an H-8 hydraulic catapault. Work on the catapault got under way in December, 1951, with a year to finish.

Together with the road and bridge work, A-H&B has several other items including the moving of quarters, arresting-gear installation, and miscellaneous features that will increase its contract to approximately \$2,500,000.

The bridges are composite timber-concrete design, with all the timber creosoted. Five-pile bents on 20-foot centers are capped to support a laminated timber deck that is covered with concrete. In some locations the piles are 100 feet long. The laminated decking consists of alternate 2 x 8's and 2 x 10's into which pins are inserted to resist horizontal shear, and to prevent the concrete from sliding on the wood. Finished roadway on the bridge is 26 feet.

H-8 Hydraulic Catapault

One of the more unusual types of construction at the Naval Air Station is the H-8 hydraulic catapault project. While the Test Center already has catapaults, they are adequate only for launching the smaller operational fighter-type planes. They are not of sufficient length, and cannot develop the energy required, to put modern high-speed aircraft into flight. Therefore, since many of the aircraft under test care are of the heavier carrier-based type, it was necessary to provide a catapault of sufficient length and power

(Concluded on next page, col. 3)

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Division Manager for M-C&S

E. Walter Hammer has been appointed Manager of the Industrial and Building Construction Division of Merritt-Chapman & Scott Corp., New York, N. Y. He was formerly with the organization for ten years as Project

Manager, during which time he directed construction of a wide range of industrial and building projects including a hot and cold-rolling strip mill at Pittsburgh, Pa., and a ground-wood newsprint mill at Lufkin, Texas. Mr. Hammer replaces Myles C. McGough, former Vice President.



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Navy Extends Runway To 14,300 Feet

(Continued from preceding page)

to cause a catapulted plane to reach flying speed and become airborne before reaching the end of the catapult.

The H-8 will be used in testing new aircraft with high takeoff speeds, and for experimentation in connection with the development and installation of catapults on modern carriers. Before any type of carrier-based plane is catapulted from a carrier, it is shot into the air from a catapult at the Test Center.

Located at the westerly end of 13-31—the 9,700-foot runway—the new H-8 is practically all underground since the only visible part of the catapult after completion is the plane track. The four 100-hp catapult motors, four oil compressors, hydraulic ram, and associated machinery are housed in a subterranean reinforced-concrete waterproof structure approximately 80 x 120 feet in plan, and about 25 feet deep. Total depth of excavation was 27 feet, and since ground water is only 9 feet below the surface at this point, wellpoints were required during the construction.

The big underground chamber is supported on 70-foot piles, and built of 4,000-psi concrete. Wooden forms were used in the construction, and transit-mix trucks delivered the concrete to the job site. Concrete was either chuted directly into the forms, or handled by crane and bucket.

Cables from the catapult engines to the track above are run through fair leads and around sheaves to provide traction for the catapult carriage. The hook engaging the plane is attached to the carriage, and tows the plane down the track for launching. The contract price for this facility does not include the machinery, which is supplied by the Government. Future plans call for the construction, at the other end of the same runway, of a new steam-driven-type catapult invented by the British and equipped with centering devices.

Personnel

The Commander at the Patuxent Naval Air Test Center is Rear Admiral Alfred M. Pride; Captain Jesse S. McClure is Commanding Officer; Commander E. J. Quinn, CEC, is Public Works Officer and Resident Officer in charge of construction; Commander



Official U.S. Navy Photo

Commander E. J. Quinn, CEC, USN (left) confers with Captain Jesse S. McClure, USN Commanding Officer of the naval station at Patuxent, Md.

N. H. Twitchell, CEC, is Assistant Public Works Officer.

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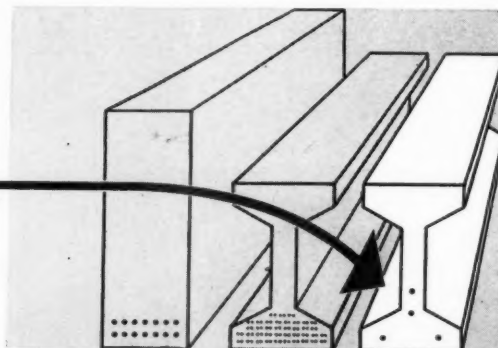
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Easy Control System On New Power Barrow

A power barrow with interchangeable skip and platform is made by Precision Equipment, Inc., P. O. Box 168, Danbury, Conn., under an agreement with The Winget Co., Ltd., England. The Winget Precision Mechanical Moke has a skip capacity of 9 cubic feet. It can make a 360-degree turn on its own axis. A forward or reversing motion is obtained by turning the steering wheel 180 degrees.

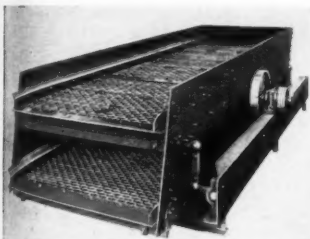
When pressure is applied on the steering wheel, it tilts and the brake is released. Then the clutch and accelerator are engaged, and the barrow moves off in whatever direction the arrow indicator points. To stop, the wheel is released. There is only one control for throttle, clutch, brake, and steering.

The barrow is powered by a 2.4-hp Wisconsin engine mounted on a turntable. The company points out that 1 gallon of fuel will run the unit for 8 hours.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 171.

Vibrating Screens

A line of vibrating screens for all types of aggregate is offered by Screen Equipment Co., Inc., 1750 Walden Ave., Buffalo 25, N. Y. Made in single, double, and triple-deck units, the Seco screens feature a fully controlled true circular action. The company points out that the rigid connection between live screen and base frame at four points eliminates resilient softening of the action.



Eccentric shafts are mounted on four double spherical roller bearings. Cast-steel housings, seamless steel tubing, and labyrinth grease seals protect moving parts. Models are made with capacities from 50 to 350 tons per hour.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 135.

IRF Award to Swedish Leader

Malte Jacobsson, President of the Swedish Road Federation and Chairman of the Swedish Atomic Energy Commission, has been selected for the International Road Federation 1952 "Man of the Year Award." His selection as a civic leader who has made outstanding contributions to highway development was announced at the IRF meeting last October in Paris. A special presentation ceremony will be held in Stockholm early next year.

Gov. Jacobsson, former Governor of the State of Goteborg, Sweden, has pioneered highway development and improvement in Sweden for many years and has contributed to many international meetings on highways and

highway transportation. This year he toured the United States to observe highway conditions and advances.

The 1951 award holder is Romulo O'Farrill, Sr., President of the Mexican Highway Association.

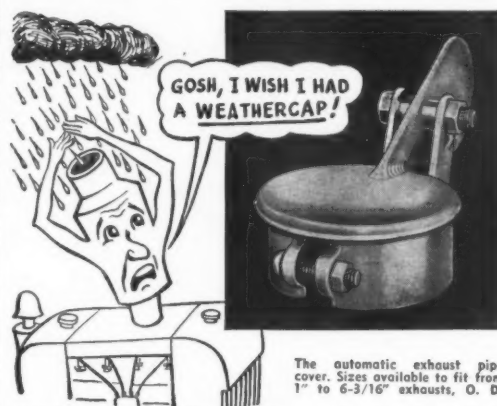
Barber-Greene's New Office

Barber-Greene Co., Aurora, Ill., manufacturer of conveyors, loaders, ditchers, and asphalt-mixing and paving equipment, has moved into its new office building, adjacent to the main plant in Aurora. Of contemporary design, the structure is 250 feet long with almost 55,000 square feet of office space. It is an L-shaped reinforced-concrete building with a stainless-steel and glass-enclosed reception area at the juncture of the arms of the L.

Sound proofing, air conditioning, and radiant heating are features. On the second floor there are two customer conference rooms, separated by a common motion-picture projection booth from which pictures can be shown in

either conference room. The movie equipment is concealed by drapes and paintings, which withdraw to permit projection through windows.

The company's former office, connected to the plant, has been given over, in part, to shop operations and sales and service training.



The automatic exhaust pipe cover. Sizes available to fit from 1" to 6-3/16" exhausts, O. D.

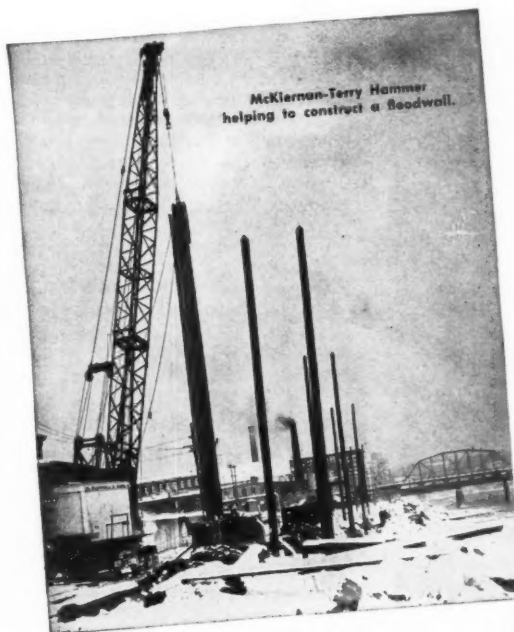
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McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 19 PARK ROW, NEW YORK 38, N. Y.
Plants: Harrison, N. J. and Dover, N. J.

McK 328

HERE are a few of the construction projects on which Daniel O'Connell's Sons, Inc., general contractors of Holyoke, Mass., have used a powerful, dependable McKiernan-Terry Double-Acting 9-B-3 Hammer.

FOR A BUILDING

Constructed close to the Holyoke canal system, the foundation for a new building required over 200 timber piles up to 30 ft long which were driven to capacity with the McKiernan-Terry Hammer.

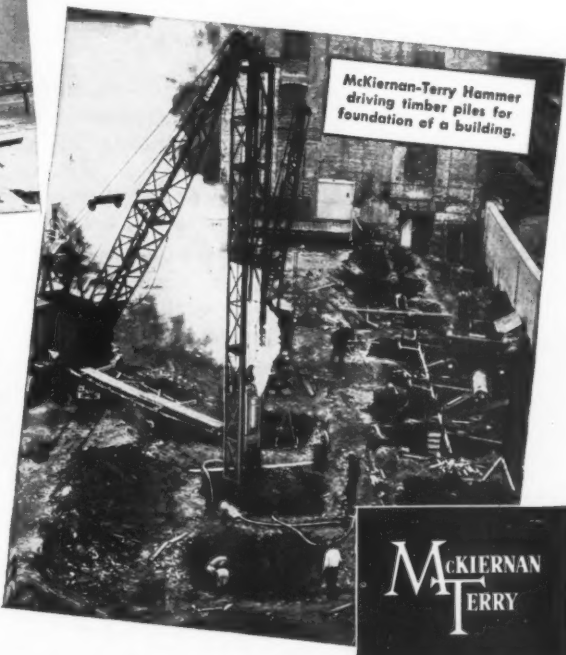
FOR A FLOOD WALL

The new Holyoke concrete flood walls and earth dikes required a steel sheet pile cut-off wall. The steel sheeting, up to 60 ft in length, was driven to refusal with the McKiernan-Terry 9-B-3 Hammer.

FOR A BRIDGE

A new South Hadley, Mass. highway bridge over Stony Brook has abutments which needed 110 steel bearing piles over 20 ft long. These were driven to ledge with the McKiernan-Terry Double-Acting 9-B-3 Hammer.

Contractors all over the world have proved the power, dependability and versatility of McKiernan-Terry equipment. Bulletin describes complete McKiernan-Terry line including 16 sizes of pile hammers and 2 sizes of pile extractors. Write for your copy today.



McKiernan-Terry Hammer driving timber piles for foundation of a building.

**McKIERNAN
TERRY**

One-Pass Stabilizer Speeds Shoulder work

Recent shoulder stabilization work on Section 7 of the New Jersey Turnpike required the contractor to do a fast job of mixing in place the existing stone and limestone screenings with bituminous material. Union Building & Construction Co. chose a P&H single-pass stabilizer and was able to process up to 2½ miles per day maximum.

Heavy spring rains had eroded some of the shoulder, and it was necessary to preserve about 20 miles of 5 and 10-foot shoulder in the Hudson County area until a permanent third lane is added at a future date.

The job started on July 28 and was finished in a matter of days. The work consisted of first scarifying with a motor grader and then applying MC-3 cutback asphalt with a one per cent anti-stripping additive at the rate of 1.2 gallons per square yard. After this the P&H stabilizer's high-speed rotors



C. & E. M. Photo

A P&H stabilizer processes 5-foot strips of a 10-foot shoulder on the New Jersey Turnpike. Union Building & Construction Co. was the contractor.

cut and pulverized the existing material, mixed the bitumen in with its violent pugmill motion, and spread in a level 2-inch layer. A wobble-wheel roller followed right behind to compact the mixture. A Caterpillar grader then shaped the surface and a 10-ton flat-

wheel roller did final rolling.

A second coat of RC-3 cutback asphalt was applied as a surface treatment. Cover aggregate at 25 pounds per square yard was laid on top immediately and dragged with a light-weight broom. A 10-ton roller finished the job.

The stabilizer is a self-contained unit that does its own digging, pulverizing, blending of admixtures, and final mixing and placing. The unit consists of a crawler-mounted frame, 165-hp GM diesel engine, all-hydraulic control system, and 5-foot-wide processing chamber. The first rotor in the chamber has 52 3-inch-wide replaceable teeth that shave and pulverize the in-place material. The second rotor with 40 6-inch-wide staggered blades provides a shuttle-like motion and also sweeps the subgrade. This motion tosses the material to the twin pugmill made up of 24 teeth set at a 30-degree angle to the line of travel.

The stabilizer has 6 forward and 6 reverse gears and is operated by one man. The 5-foot model on the Turnpike job cut about 2 inches deep, and spread the mixed material in a smooth layer.

Bituminous material was applied by two 1,200-gallon distributors. Two 5,000-gallon tankers, traveling about 10 miles to Standard Oil in Bayonne, N. J., supplied the distributors.

The job was supervised by John Cowles. The entire operation required 2 foremen and 11 men. Edwards and Kelcey, Frederick R. Harris, Inc., and O. J. Porter & Co. prepared the plans and specifications. Howard Needles was General Consultant. Charles M. Noble is Chief Engineer for the Authority, and J. A. Rooney is Maintenance Engineer.

New Chisel Retainer For Riveting Hammers

A safety chisel retainer for riveting hammers has been developed by the Arrow Tools, Inc., 1900 S. Kostner Ave., Chicago 23, Ill. The retainer converts pneumatic riveters to a tool for riveting and metal cutting. It may be used in maintenance and repair or demolition of all types of steel structures.

The retainer, which is said to be easily adapted to all makes of hammers, prevents accidental discharge of the tools from the hammer barrel, eliminating serious accidents and loss of time and the tools.

With the arrow retainer a rivet ham-



Jobs Done Quicker, Cheaper

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LOS ANGELES 21, Calif.
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MEMPHIS 3, Tenn.
268 Madison Ave.
NEW YORK 7, N. Y.
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mer can be used for light demolition work, concrete or brick floors, walls or sidewalks, and can be used for opening walls and partitions for doors or windows.

Further information may be secured from the company by requesting Bulletin RH-952. Or use the Request Card at page 18. Circle No. 195.

Bulletin on Tooth Bases With Renewable Cutters

Die-forged alloy steel tooth bases with reversible and renewable cutters are described in a bulletin put out by the Blaw-Knox Division, Blaw-Knox Co., P. O. Box 1198, Pittsburgh 30, Pa.

The bulletin points out that the tapered shank of the cutter wedges securely into the tapered pocket in the base. For replacement, a sharp hammer blow on the sides of the cutter loosens it from the base.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 193.

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Less cost

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You get *more work* out of a bucket that holds steady and is back in position *quicker* for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

You get *lower costs* through faster operation coupled with Rud-O-Matic's trouble-free service. No pins, weights or tracks to get out of whack, only the simplest of working parts. Compact — and easy to install on any crane.

Rud-O-Matic Taglines are made in 8 models for all bucket sizes, and are supplied with cable and installation equipment.

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Good-Roads Program Launched by County

From 25 to 40 Miles of New Work Yearly, With Maintenance of Highways and Bridges, Makes Excellent Program

BEXAR COUNTY, Texas, is well known for its concentrated program for better county highways. Not only does this county have a Highway Engineering Department; it has four County Commissioners and a County Judge, all of whom are deeply conscious of the important role America's county roads play in the over-all transportation system of this nation. And they are in a position to do something effective about roads.

Currently, Bexar County highway contracts are seen in almost every issue of regional construction jobs of south-central Texas. Contractors in the state have a new awareness that Bexar County highways are being expanded and improved. One of the biggest contractors in the state recently bid a Bexar County oiling job; a consulting-engineer firm came in to make a quick design of a major bridge improvement, which was also let by contract. Drive any direction over county roads from San Antonio, and you will find competent maintenance crews with late-model powerful equipment working on the upkeep of these highways.

Bexar (pronounced "Bear") County has always had a good road program, but this year more than ever it is concentrating its efforts to improve the system still further. Some 40 miles of new construction has been programed, and 25 miles has already been finished. The County's construction program makes use of maintenance and construction forces and equipment to do the necessary grading and base work, after which a contract is let for the application of a 2-course asphalt-penetration treatment. With the emphasis on adequate drainage and a heavy enough thickness of granular base to hold the traffic loads, the penetration skin treatments are showing a gratifying tendency to last for many years with little maintenance.

Directing the program from County Judge level is Charles W. Anderson. The four Commissioners include Dan P. Traugott in District 1; Sam C. Bennett in District 2; R. L. Reader in District 3; and A. J. Ploch in District 4. Under a 1947 law passed by the Texas Legislature, Bexar County is operating its Road Department under the Optional Road Law, which tends to centralize highway functions and equipment under a County Engineer. With the cooperation and help of the Commissioners and Judge Anderson, County Engineer C. I. Swan and Executive Assistant County Road Engineer Walter P. Schulze are working toward a program which will take advantage of all the economies and efficiencies of the consolidated system, but will preserve the individual awareness of county-wide road improvements at the traditionally established precinct level. It takes big men with open minds to work out a changeover like that, and these men are doing it.

Metropolitan County

Bexar County, with the half-million-population city of San Antonio in its center, can be classed as a metropolitan county, even though many of its county roads carry school buses, milk trucks, and farm vehicles. The county is gently rolling to level in terrain, and contains no many small watersheds that the maintenance and reconstruction of timber bridges is now something of a problem.

The county highway system totals 1,516.19 miles, and of this total 351.01 miles is now paved, 748.99 miles has a high type all-weather gravel surface which can be converted to subbase in the future, and about 416.19 miles of lower-type roads which are rapidly being brought up to higher standards. As a general rule, the county roads carry something less than 250 vehicles per day. When the traffic count gets over 250 vehicles, studies are made with the Texas State Highway Department to incorporate the section in the state

secondary system. Including all State and U. S. highways, Bexar County's total transportation system has 1,733.03 miles.

In addition to the usual county share of gasoline and registration fees, Bexar County is now in the enviable position of having authority from its citizens to levy a 30-cent ad valorem tax, for-

merly collected by the State for secondary highway improvement. This is bringing much-needed revenue in to help with the current program. Excellent cost and budget records are being kept on all items, and a typical breakdown of the 1952 calendar-year budget is as follows:

(Continued on next page)



20 Second START

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Amsco Chains Super-Toughen With Use



How AMSCO Manganese Steel Chains Acquire Progressively Greater Resistance to Impact and Abrasion.

AMSCO Chains are made of Manganese Steel—the "Toughest Steel Known." They are produced in many standard and special shapes by American Manganese Steel Division—largest producer of manganese steel for all industry. Users of AMSCO Chains benefit by unusual freedom from expensive chain replacement, breakage, maintenance-down-time and other problems caused by impact and abrasion conditions.

AMSCO Manganese Steel Chains have the unique ability to work-harden with use. In rough service, they develop a surface hardness as high as 500 Brinell. They also acquire a super-hard glass-like polish that helps shrug off grinding abrasion. All AMSCO Manganese Steel products—tough when produced—possess the extra-value quality of actually increasing durability with in-use battering and grinding.

Actual case histories prove that AMSCO Manganese Chains outlast ordinary chains by more than 6 to 1 where impact and abrasion exist. For example, on one conveyor operation, ordinary chain had to be completely replaced every three months. When AMSCO Manganese Steel Chain was installed, only a small fraction of the links were replaced during a test period of over 24 months.

If you use chain, and desire a more durable alloy, you are invited to contact AMSCO. There's a good chance we can save you money and provide chains that will outlast your service life expectations.



Drag Line Type Chain—Mining & Excavating



AMSCO Chain Assumes Many Forms To Serve Industry. A Few Are:

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Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Good-Roads Program Launched by County

(Continued from preceding page)

General Road and Bridge Fund

Salaries	\$222,550.40
Road materials	18,667.00
Machinery repair	11,333.00
Auto and truck repair	6,067.00
Gas, oil, grease, and diesel fuel	16,667.00
Right-of-way, contracts, graveling, paving, bridge structures, and all types of permanent construction, engineering, and equipment	111,657.20
Total:	396,408.60

Farm-to-Market and Lateral Highways

Salaries	111,275.20
Road materials	9,334.00
Machinery repair	5,667.00
Auto and truck repair	3,034.00
Tires and tubes	4,734.00
Gas, oil, grease, and diesel fuel	8,334.00
Right-of-way, contracts, graveling, paving, bridge structures, and all types of permanent construction, engineering, and equipment	136,530.05
Total:	278,908.25

Organizationally, the county is still divided into four subdivisions, or districts, with every effort being made to blend the total effort for the general benefit of the county at large. Maintenance, particularly, is divided within the four districts. New construction, somewhat more centralized at San Antonio headquarters, is also spread throughout the county. Some efforts are now being made to inaugurate some modified form of a sufficiency rating, which will establish a construction pri-



Ray Day Photo

An International tractor with a front-end loader cleans up the excess dirt from a ditch-pulling job and loads it out to this Ford truck on one of Bexar County's road-improvement jobs.

ority for the various highways necessary.

To maintain the necessary close liai-

son, the Commissioners hold a business meeting three times a week, usually on Monday, Wednesday, and Friday mornings. Business matters and highway details of all manner and shape are threshed out, and the necessary solutions arrived at.

Another piece of organizing in the county is of particular interest: there is an official Complaint Department, labeled by a big sign which hangs over the Complaint Clerk's booth. As complaints come in from citizens this clerk makes a routine ticket in multiple quantities, gives each ticket a number and makes a record. The tickets are quickly taken to the various district foremen and superintendents by two timekeepers, working out of the San Antonio office. If a complaint can be remedied with equipment and materials at the field's disposal, the neces-

New R

The new built to go county is is good through For maj roadbed straight cr variation o grade dens sum of 90 some Mod by the T The Count rator gra clovels to Altop the or granula placed. and its ov good calic area, but round mor ably an ard and l General ounted the pi at pit-r inch-mi ne. It ma terial. The ma until the n is then sp each edge necessary, scale blen and is ther Pneum are av course. Th line along rator gra excellent When th specifica sockets an interfere way. The while—a f vent edge station sh 24-135 quickly crushed ro er 80 so second pe tion of d by

Familiar Scenes ON CONSTRUCTION JOBS



Water Lines
by NAYLOR

When construction jobs call for water lines, there's good reason why contractors specify Naylor pipe. Its light-weight makes for easier handling and installation. Its distinctive lock-seamed and spiral-welded structure assures extra strength and safety. When connected with the time-saving Naylor Wedge-Lock coupling, it gives you the most practical combination for the heavy-duty service you require.

Write for Bulletins No. 507 and No. 513.

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You can't beat
DUFF-NORTON
JACKS
for Construction
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The jacks illustrated are only a few from the Duff-Norton complete line—for every lifting, lowering, pushing or pulling requirement on all kinds of construction jobs. Jacks are available in ratchet, screw, hydraulic and air motor types—with lifting capacities ranging from 3 to 100 tons.

For complete data write for Catalog 203D.

Labels for jacks shown: Bell Base Jack, Cable Reel Jack, Trench Brace, Self Lowering Screw Jack, General Utility Jack, Ratchet Jack, Bridge Jack.

THE DUFF-NORTON MANUFACTURING CO.
MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.
"The House that Jacks Built"

Labels for jacks shown: Hy-Power Hydraulic Jack, Low Height Screw Jack, "Lo-Hite" Hydraulic Jack.

any action is immediately taken. If it cannot be made, an explanation is written on the ticket. In any case, the completed ticket comes back into the main office to a follow-up system which insures that citizen's complaints are taken care of. It is paying off in good public relations, and of course it is getting bad places in the highway system taken care of practically as soon as they develop. The complaint clerk, incidentally, also does most of the detailed cost accounting, and is one of the most valuable men in the Bexar County organization.

New Roads to High Standards

The new improvement work is being built to good design standards, and the county is fortunate in having a generally good subgrade soil for road building throughout its length and breadth. For major paved improvements, the roadbed is shaped with a 3-inch straight crown and a side-ditch depth variation of from 6 to 18 inches. Subgrade density measures up to a minimum of 90 per cent, measured by the Modified AASHTO method used by the Texas Highway Department. The County has the necessary trucks, motor graders, and tractor-mounted shovels to do this work.

Atop the finished subgrade, a ballast of granular base course 8 inches thick is placed. Many years ago the county had its own gravel pits in the many good caliche deposits common to the area, but in later years it has been found more economical to pay approximately an 8-cent royalty per cubic yard and load it with county equipment. Several 1/2, 1, and 2-yard tractor-mounted shovels load this material, and the pits have been so well picked that pit-run material will meet about 1/2-inch-minus specifications most of the time. It makes an excellent base-course material.

The material is hauled in by truck until the right amount is dumped, and is then split to place a windrow along each edge. The caliche is watered as necessary, blade-mixed until an intimate blend of particles has been made, and is then laid out by the motor graders. Pneumatic and steel-wheeled rollers are available to compact the base course. The final rolling is carefully done along with a tight blading by motor graders to put the base down to excellent grades.

When the oiling contracts begin, the specifications require that all loose dust pockets and other things which might interfere with a good job be swept away. The base is then primed 22 feet wide—a foot overlap over each pavement edge—with MC-1. The first penetration shot consists of .25 gallon of OA-135 per square yard, which is quickly covered by 3/4-inch-minus crushed rock at the rate of 1 cubic yard per 80 square yards of surface. The second penetration shot consists of .35 gallon of OA-135 per square yard, followed by an application of fine 1/4-inch-



Ray Day Photo

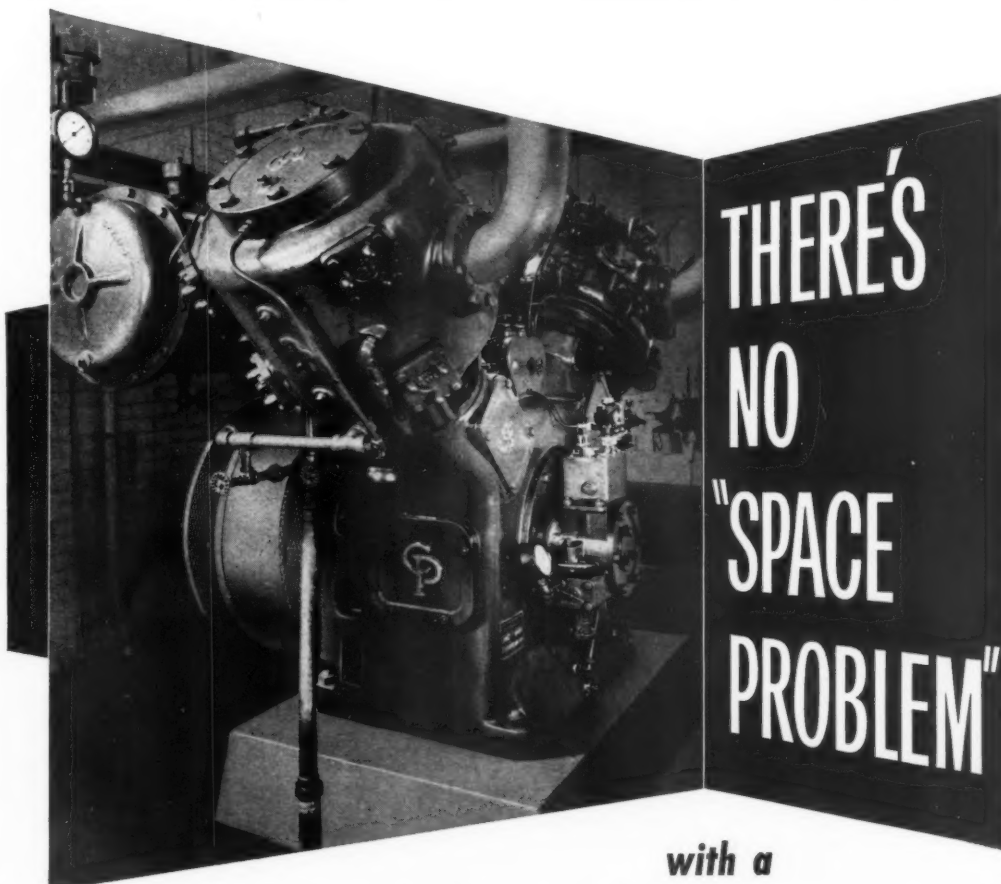
County Road Engineer C. I. Swan (left); Executive Assistant Walter F. Schulse; and Maintenance Superintendent O. K. Kramer hold still for the camera as they discuss a small job in Bexar County, Texas.

minus aggregate applied at the rate of 1 cubic yard to 140 square yards of surface. In some cases, Uvalde crushed rock, containing a small percentage of asphalt, is used. When this is used, the total of the OA-135 input amounts to 1/2 gallon per square yard for the two shots.

After a thorough rolling with 5-ton maximum rollers, the surface is allowed to take traffic for a week, after which time the contractor comes back, sweeps the loose material together, and rebeds it with a roller. This usually does a fine job. No heavier rollers are permitted because the asphalt must be laid intact, without pushing the rock through, to break its water-sealing qualities. A finished penetration job is truly a roof over a good subbase in this county.

Considerable replacement of old timber bridges with concrete pipe culverts is also under way, with maintenance forces. Several bigger bridges are either under construction or contemplated. Plans are being formulated for a spe-

(Concluded on next page)



with a

Class Y Compressor

— and only a simple foundation is needed for this exceedingly compact unit.

Shipped intact as a "package" requiring only external connections, the Class Y is easy and inexpensive to install, and may readily be moved, intact, to another location if desired.

Yet it is built for continuous, heavy-duty service, with CP features that assure high efficiency and low maintenance . . . large area Simplate valves . . . multi-step capacity regulation . . . effective inter-cooling . . . precision bearings . . . force-feed lubrication.

In sizes from 75 hp. to 250 hp., 500 cfm to 1663 cfm; with direct-connected, flange-mounted synchronous or squirrel cage motor. Also available with belted and coupled motors.

Write for Bulletin 766

USE RIGHT BUCKET FOR THE JOB



Haywood makes all three—clam-shell, electric motor, orange peel. A Haywood recommendation is unbiased.



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ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Good-Roads Program Launched by County

(Continued from preceding page)

cialist road crew which can build, maintain, or better a highway. Generally speaking, the new 20-foot paved county highways are costing about \$9,500 per mile, with possibly a few of the tougher ones running over \$10,000; this includes small culverts and complete reconstruction of an existing road.

The improved road-building policy is receiving good public support from people who know their road men are some of the most alert competent technicians on the map. The commerce of Bexar County is moving easily and smoothly, thanks to a well planned system of highways and a group of men—commissioners and engineers—who decided the way to a better road system was through the route of co-operation and understanding of each other's problems.



Barnard & Leas' elevating attachment goes to work with a Galion motor grader.

Elevating Attachment

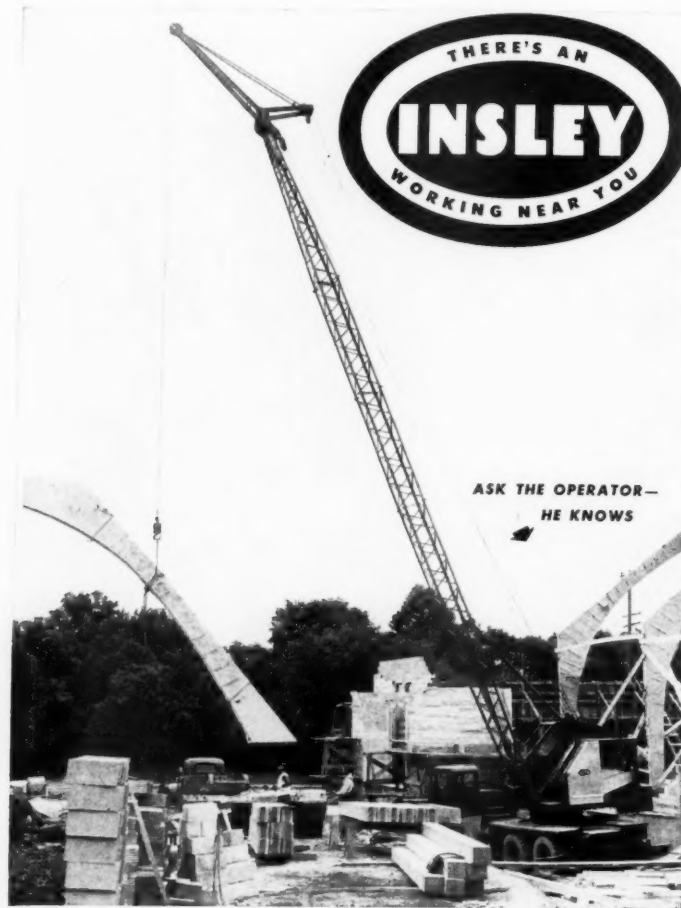
A heavy-duty elevating attachment for Galion motor graders is announced by Barnard & Leas Mfg. Co., Inc., Cedar Rapids, Iowa. The unit is said to be well suited for casting, stripping, loading,

and terracing.

Among the main features are finger tip control, heavy-duty frame, easy mounting, adjustable plow disk, extendable length carrier, and auger-type cat-hole cleaner.

The standard 16-foot conveyor may be extended to 19 or 22 feet. The belt width is 42 inches. The special alloy disk has a 30-inch diameter. The unit is connected directly to the motor-driven shaft through V-belt sheaves to heavy-duty disk clutch. The estimated capacity is from 1,000 to 1,800 cubic yards per hour.

Further information may be secured from the company. Or use the Reader Card that is bound in at page 18. Circle No. 122.



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HE KNOWS

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that Insley Equipment can be rated-for-the-project... he knows that specification alternates make it possible to buy the exact equipment to do his job best.

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On the job...and on the bond
EXPERIENCE COUNTS

Excavating endless tons of shifting sands... channeling billions of gallons of water through vast stretches of waste land—is another staggering exhibition of the technical mastery, the pioneering drive, of American engineers and contractors.

Experience here—as in any field—is the element essential to consistently outstanding performance.

The experience which the Aetna Casualty and Surety Company has gained through over 40 years' association with the great construction industry is your assurance of the same prompt, intelligent contract bond service that Aetna has rendered to many hundreds of firms, large and small... on jobs of every conceivable type and size, all over the country.

"No Job
too Big—
No Job
too Small"



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★ Let Your Dollars Fight Polio ★



Concrete is poured over runs of wrought-iron pipe during installation of the hidden floor-type radiant-heating system serving the modern one-story passenger station of the Boston & Maine Railroad, Lynn, Mass.

Radiant-Heat System

A passenger railway station presents special heating requirements, and the new Boston & Maine station at Lynn, Mass., was no exception. There was the problem of varied heating needs; passengers wearing the same bulky clothing necessary for protection against outdoor winter weather were not likely to be comfortable in shirt-sleeve temperatures suitable for employees of the ticket office. Also, there were the possibilities of overheating the restaurant and excessive heat loss from frequently opened outer doors.

The problems were solved by the selection of a radiant-heating system. The spacing of the wrought-iron pipe, embedded in the concrete floor, was varied. Eight-inch spacing of 1 1/4-inch pipe now brings extra heat to the ticket office, while 12-inch spacing of the same-size pipe maintains adequate warmth in the waiting room. In the restaurant, one-inch pipe is laid on 16-inch centers.

The wrought-iron pipe was made by A. M. Byers Co., Pittsburgh, Pa., manufacturer of radiant-heating systems.

New Magnesium Tongs

New magnesium brick tongs have been announced by Magline Inc., Pinconning, Mich. The unit weighs 2 1/4 pounds and handles up to eight bricks per load.



The tongs are said to provide instant span adjustments and positive span lock in one operation. This is accomplished through engineered spring action, and eliminates the need for bolts, pins, or other removable parts.

Brick-gripping surfaces are of specially alloyed magnesium to protect against wear, and are grooved to prevent brick slippage. The tongs are capacity-rated.

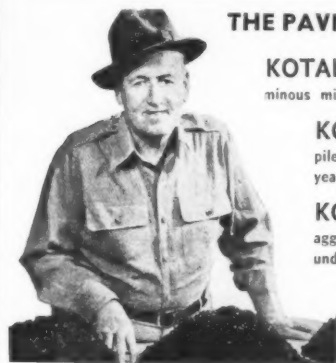
Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 183.

Data on Earth-Boring Unit

Literature on an earth-boring machine that digs holes 6-20 inches in diameter is available from Highway Trailer Co., Edgerton, Wis. The Model HD can be mounted on a truck or

tractor and digs 7-10 feet deep. A 2,500-pound-capacity winch and a pole derrick for handling poles up to 45 feet can also be furnished.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 162.



THE PAVING-WISE ROAD MAN KNOWS—

KOTAL PROCESS makes a tougher more durable bituminous mix and assures a superior pavement.

KOTAL PROCESS water and weatherproof stock-pile-mixes can be used for road maintenance work all year 'round.

KOTAL PROCESS is excellent for coating wet aggregate and producing mixes that will not strip even under severest conditions.

Write for up-to-date laboratory findings.

KOTAL COMPANY
360 Springfield Ave. Summit, N.J.

SAW CONCRETE... OR ASPHALT

with CLIPPER CONCRETE SAWS

THIS FAST-EASY ECONOMICAL WAY!

NOW SAW... BEFORE BREAKING! On patches and trenches the removal costs are reduced more than 25% and replacement material is poured to straight, smooth edges. A sawed cut made 1/4 the slab depth provides a perfect plane of weakness for fast breaking and removal.

Patches...

Eliminate spalling and fractures around repair patches by sawing before breaking. Saw clean, straight lines, break smooth, then patch perfectly in building floors, runways, drives, etc.

Trenches...

Gas, Water, Electric, Sewer, Telephone... wherever new lines are installed or old ones repaired. Saw trenches... any width... then break out to straight, smooth edges — no fractures beyond removal lines.

Contraction Joints...

Saw contraction joints in continuously poured slabs and eliminate costly hand forming and usual spalling. Building floors, highways, streets, runways, walks, etc. can all be sawed.

MODEL C-130

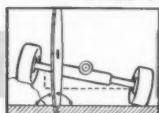
One of FIVE MODELS
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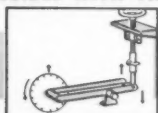
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You can TEST—actually TRY a Clipper Concrete Saw on YOUR Job without obligation! Write for details!... by the Originators of Masonry Saws.

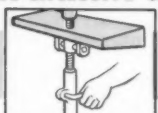
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Welding Gains Favor In Structural Design

**AISC Authority Points Out That Engineers Can Now Rely
On the Calculated Strength of a Weld**

• BOTH shop and field welding of steel structures is becoming more popular every day, reports Harry B. Corlett, District Engineer of the AISC. Speaking at a recent meeting, Mr. Corlett said that welding techniques have been developed to the point where design engineers can now rely on the calculated strength of a weld.

As far as the fabricators are concerned, he pointed out that since welding is here to stay, the over-all picture is all that counts. "If the saving in material overbalances any increased

shop cost, if a better and lighter structure results," he said, "then welding is the answer."

To the engineer, the advantage of welding lies in the fact that it lends itself to economical continuous construction with fixed connections, and details such as fastening a base plate to a column. In beams, just the difference between figuring moments as WL/12 instead of WL/8 makes a saving in the weight of the main material. The simplicity of welded construction also makes a saving in the weight of detail

pieces such as gusset plates and connection angles. Laying out for punching, as well as the punching itself, is saved. And there is no loss of strength from punching a member full of holes. To the engineer, welding means a lighter structure with economical continuous construction.

The acceptance of welding in the industry has been resisted in the past by two groups: the designing engineers and, until just recently, a large segment of the fabricators.

From the Engineer's Viewpoint

The designing engineers have been loath to accept the reliability of welds. The engineer says he knows quite closely what a rivet will hold, but he can't be sure of the strength of a weld. He always refers to the human element in making a weld. A weld is no better than the man making it and many things can go wrong in the operation which may produce a doubtful result. The answer to that is that a weld is a good method of making

a connection—if it is properly made. It can be properly made, Mr. Corlett insisted, if the qualifications of the welder and of the inspector are investigated.

If a weld is made by a qualified welder, and if a qualified inspector watches it being made, and then looks it over after it is made, he can tell by visual inspection whether or not it is a good weld. Visual inspection will reveal any rank defects such as undercutting, gross cracking, porosity, or imperfect beads. One of the deterrents to the acceptance of welding has been that welding should be perfect. Gamma-ray and magnaflux inspection are methods of determining a perfect weld. In a pressure vessel or on vital connections in some structures, perhaps perfection is necessary. In a building it is not. Nothing else in the building is perfect. It is not designed to such a degree of perfection. If it was riveted, it wouldn't be perfect either. These inspection methods mainly reveal minor flaws such as slag inclusions and gas bubbles, which are not important.

In designing a weld, the engineer uses a working stress that is very conservative. It has a factor of safety in it that takes care of these minor defects. If the designing engineer has any doubts, he can (and usually does) call for a little longer bead or an over-size bead. There is no reason why a designer should not put the same factor of safety in a weld that he does in anything else, commented Mr. Corlett.

... And the Fabricator's

As to the fabricators, if the welding has some advantages over riveting, why haven't the fabricators been eager to accept welding? For one thing, many fabricators have felt that they could get more tonnage through the shop by riveting. Here Mr. Corlett pointed out that the tonnage might not always represent the most economical job for the owner, or the best job for meeting competition.

Fabricators have opposed welding because it requires more room in the shop than they have. With a production line set up for punching and riveting, production is slowed by having to spread material out for welding. It is especially bad when there is both welding and riveting on the same material. Nevertheless, they think the job might be more economically fabricated if the shop was set up for it, with plenty of room and modern welding equipment.

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how we could
operate without
Motorola
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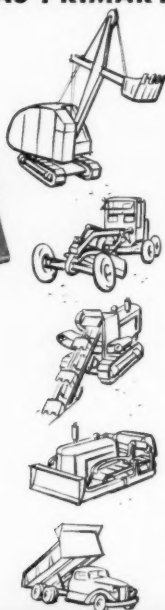


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MAINTENANCE AND CONSTRUCTION MEN CONSIDER
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The Uni-Channel can be used as a fixed or fully mobile station. Easy to set up and easy to operate. Just plug in, connect antenna and go to work. The Motorola Permakay filter eliminates 15 nuisance tuning adjustments forever.



In any wide-spread, hard-driving operation you can count on Motorola 2-way radio to get machines and men on the job faster, keep supplies moving. Motorola mobile radio will streamline your operation, boost your efficiency.

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Rogers Majestic Electronics Ltd., Toronto, Canada



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891 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

Another fabricators' objection to welding has been that they felt they had an investment in punching and riveting equipment which had to be protected. Although welding will certainly be used more and more, said Mr. Corlett, the time seems to be a long way off when riveted work will be eliminated.

Most shops can still fabricate a roof truss more cheaply by riveting. Perhaps the design is a line diagram and the engineer did not develop welded details. If the fabricator has a choice, he sees the job going through the shop faster if he does not have to weld it. Certainly a pair of connection angles can still be put on a beam more economically by riveting, if there is any quantity at all. With the equipment of the large companies a plate girder can be riveted at a lower cost than it can be welded. There is, however, no prospect of riveting equipment being junked, and if bolts have the future many authorities expect, punching equipment will still be used.

For an item like a roof truss, in general, riveting is the preferred method of fabrication. However, if the details are well worked out for welding, if there is enough duplication to warrant jigs and a real setup for handling the job, if there is plenty of room, and if best welding equipment is on hand, the fabricator will probably prefer welding.

A Future for Bridge Welding

On long-span bridges there is no precedent for much welding, and probably no prospect of it. On short-span bridges there certainly is a future for welding, and on beam-and-girder spans welding is well on its way to being greatly used. In San Francisco there are plans (with some of the work already under construction) for 15 miles of all-welded beam-and-girder spans. This job was welded for esthetic reasons and to keep it light. Even though many of the girders could have been fabricated more cheaply as riveted plate girders, the city wanted the bridge streamlined. It is free of connection angles and fussy details, free of rivet heads, and easy to keep painted—just another reason for using welding.

Asphalt-Leveling Tool

A new asphalt-leveling tool is produced by Kay M. Grier Engineering Co., 11803 Gilmore St., North Hollywood, Calif.

Working components of the new models are extruded through specially designed dies from structural magnesium alloy, a tough feather-light metal extracted from sea water. The metal



lute bar gives off a thin surface film of magnesium oxide and carbonate which enables it to resist adhesion or sticking of asphalt mixtures, the company says. The largest model Levelute is 12 feet long x 4 feet wide and weighs 5 pounds. It is said to have tensile-strength rating of 36,000 pounds per square inch, and a compression yield of not less than 15,000 pounds per square inch. The manufacturer claims it will not rust, split, kink, dent, chip, or break in working service and will smooth and level more than 100 tons of blacktop in a day.

Standard models are produced in lengths of 6, 9, and 12 feet, with lute

bars ranging in width from 32 to 48 inches. Raking and scarifying teeth are peaked 1 inch apart, the same as an asphalt rake, for working all mixtures of blacktop. Newly designed stress brackets are made of airplane tubular duralumin and all nuts, bolts, clamps, and stabilizing fittings are approved Army-Navy aircraft design.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 184.

Koehring Sales Promotions

John S. Conway is the newly appointed Vice President in Charge of Sales for Koehring Co., Milwaukee, Wis. With the company since 1941, Mr. Conway fills the vacancy created earlier this year when Julien R. Steelman was named President of the company. He is succeeded as General Sales Manager by John E. Chadwick, formerly Western Sales Manager for the Kwik-Mix Co., Port Washington, Wis., subsidiary of Koehring.

HERE'S A FASTER, EASIER, CHEAPER WAY TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD TRAILERS



The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

- ★ Each unit built to job requirements.
- ★ Available in sizes and lengths to meet all bridge and axle laws.
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- ★ DOOR OPENING Meter control that can be pre-set.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today Dept. A

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3 BIG REASONS why the Lull Shovel loader



OUT-VALUES 'em all!

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DOES MORE JOBS

No "one-job" machine, Lull Shovel loader does scores of jobs . . . with equal efficiency. It's quickly and easily equipped for digging, loading, dozing, snow-removing, sweeping, etc. There are no problems of seasonal idleness . . . no wasted hours of standing time!

2

DOES MORE JOBS BETTER

Shovel loader's superior performance is no mere boast—it is an established fact, solidly backed by these design features: Double-Acting Bucket Control . . . Power Down Crowd . . . Longer, Higher Reach . . . Finger-Tip Hydraulic Control—plus unobstructed visibility and improved safety for the operator. These features have been proven by State, County and Municipal Highway Departments from coast to coast. Engineered to mount on and utilize the full power of the best industrial wheel type tractors, Shovel loader in no way interferes with use of the tractor for other purposes.

3

COSTS LESS TO BUY . . . AND TO OPERATE

When you buy Shovel loader, you save two ways: (1) the total cost of Shovel loader, plus the tractor of your choice, is well below that of so-called "self-contained" units, which furnish engine and loader as a unit. You select the tractor yourself from four popular makes (Minneapolis-Moline, Case, Oliver or Sheppard, each available in several models). (2) Low as Shovel loader's first cost is, it is returned to you many times over in work performed, profits earned, and expense saved.

MAKE US PROVE SHOVEL LOADER'S GREATER VALUE! See your Lull Distributor today for an actual demonstration. Or write direct for full information.

LULL

Manufacturing Company

370 W. 90th Street

Minneapolis 20, Minn.



THIS BULLETIN gives complete data on Lull Shovel loader. Have you received your copy?



Sand is child's play to the Earth-Mover—new Goodrich high-flotation tire.

High-Flotation Tire

A new off-the-road high-flotation tire that is said to provide positive

traction in sand or loamy soil has been announced by B. F. Goodrich Co., Akron 18, Ohio. The all-nylon wide-base Earth-Mover has a 65-inch 18-ply

rating. B. F. Goodrich worked with the R. G. LeTourneau Co., Inc., in developing and testing the tire.

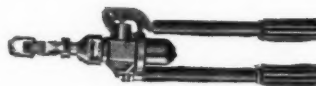
The Earth-Mover is rounded for better flotation, the company reports. In sand, it operates at 20 to 25-pound air pressures. Nylon in the cord body of the tire enables it to withstand flexing better than other cord materials, the

company says. Tapered bead seats prevent slippage on rim at low pressures. Shallow-type treads in the tire prevent it from digging in and becoming bogged down.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 185.

The Right Cutting Tools

CAN CUT YOUR COSTS, TOO!



MODEL 200-A

NEW, POWERFUL, HAND OPERATED HYDRAULIC CUTTER

Cuts $\frac{1}{2}$ " reinforcing rod and other comparable materials with ease. Simple hand pump action develops 8500 p.s.i. exerting 10 tons cutting force. Blades easily removed for resharpener. Weight — 15 lbs. Length — 24".

MANCO

SPECIALIZED CUTTING TOOLS FOR CONSTRUCTION WORK...

Cut reinforcing rod, chain, bolts, wire rope

NEW IN BOLT CUTTERS!

Reversible Jaws Give Double Blade Life

New, exclusive design gives you twice the cutting life from one set of jaws. Handles are guaranteed against breakage. Available in 30" size. Capacity, $\frac{1}{2}$ " bolts, $\frac{3}{8}$ " rod. Jaws alone available to fit standard 30" bolt cutters.



MODEL 2 MCC

PORTABLE HYDRAULIC GUILLOTINE

Heavy-duty hydraulic cutter provides $22\frac{1}{2}$ tons cutting force yet weighs only 40 lbs. Cuts $\frac{3}{4}$ " reinforcing rod, 1" log chain. Other similar models to cut wire rope. Easy hand pump action. Also available with a variety of power pump units for high speed production cutting.



MODEL 20-A

See Your Distributor or

Write **MANCO MFG. CO., BRADLEY, ILLINOIS**

TEAMWORK and Accurate Control

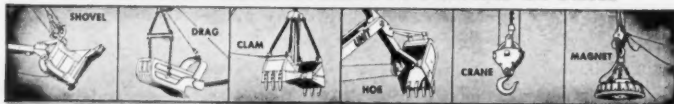
Working as a team, these two UNIT 1020 Cranes moved a 500 TON railroad bridge from its temporary mounting to the new structure in a period of thirteen (13) minutes. This type of job calls for smooth and accurate control of boom and hoist line operation. UNIT'S extra long crawlers, multiple-hinged shoes, wide axles, and hook rollers provide perfect balance and stability. This, together with the FULL VISION CAB for complete visibility, makes UNIT the machine that is dependable and safe to handle efficiently any type of heavy-duty work.

SEE FOR YOURSELF: Let us send you our novel TV Brochure. It illustrates the complete UNIT line.

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6309 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



$\frac{1}{2}$ or $\frac{3}{4}$ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL



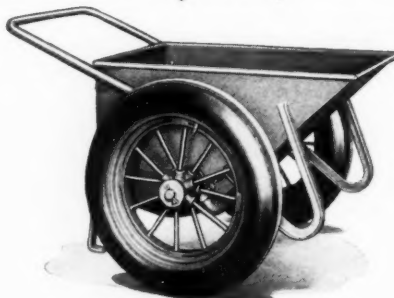
All Models Convertible to ALL Attachments!

A 7186-2/3-C

CONCRETE CARTS

EASY to WHEEL—EASY to DUMP

Perfectly Balanced!



No. 626-PR Sterling Cart with dumping rockers and 4.00 x 18 pneumatic tires.

Just the cart you need for hauling concrete or other materials. Takes a full batch from small mixers without danger of spilling. 6 cubic foot capacity, water full. Sterling quality construction. Tray made of 14 gauge steel with continuous $\frac{1}{2}$ " diameter butt-welded rod to reinforce top edge. $1\frac{1}{4}$ " T-iron rockers facilitate dumping. Roller bearings standard equipment. Choice of 30" dia. steel wheels or pneumatics. Write for Sterling Cart Catalog No. 63.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling
WHEELBARROWS



C. & E. M. Photo
A Blackhawk Trench Hog on a Ford wheel tractor was used to excavate 400 footings for a new hospital at the University of Arkansas Medical School.

Trencher Cuts Neat Footings, Saves Cost

A small tractor-mounted trencher saved money and speeded foundation work on a new hospital for the University of Arkansas Medical School. Ollard Gregory & Son, of Rose City, North Little Rock, Ark., had the excavation subcontract.

After the company had pulled 90,000 yards of dirt out of the hillside site with International TD-18's and 10-yard Heil scrapers, it went to work to excavate the 400 footings required for the 8-story multimillion-dollar health center. These footings vary in size from 4 x 4 feet, 1½ feet thick, to 18 x 18 feet, 5 feet thick. The ground being heavy clay, Gregory & Son could have gone in with a clamshell and cut the large holes easily enough, but there still would have been a lot of hand finishing on the edges. The company decided instead to bring in a small tractor-mounted trencher to slice nice neat edges first.

Planks were set on the ground and nailed to form a square matching the required footing size. Then a Blackhawk Trench Hog mounted on a Ford wheel tractor straddled the boards, one edge at a time, and cut a 12-inch slit trench all around the footing. With the hole neatly outlined, the crane operator had no trouble dropping his ½-yard clam inside the area and scooping out the dirt. With a little care, the outside edges were left neat and clean, ready for the concrete pour. No hand work, no forming.

Gregory used this method wherever the footing was big enough to work the trencher easily. To open the holes for smaller footings he used air-powered clay spades and hand shovels.

The job as a whole is a big one and running nicely. Grimshaw Construction Co., of Tulsa, Okla., has the \$8,500,000 general contract. Work started in October, 1951. The completion date is January 1, 1954. The building will be of structural concrete and will require 22,000 yards of Class 1 concrete and 2,500 tons of reinforcing steel.

Some of the column steel is unusually big—twenty-three 1½-inch-square bars wrapped with ⅝-inch round cold-rolled spirals for the main columns. Arkansas Foundry Co., Little Rock, is supplying the steel; Big Rock Stone & Materials Co., the concrete.

The spex call for a 3,000-pound concrete, but most of the cylinders have been breaking at around 4,000. It's a 1:2.5:3.6 mix, with 6.5 gallons of water to the sack. A half-pound of Pozzolith is added at the Big Rock plant to increase workability.

The Grimshaw Company has a trick up its sleeve, too, on the column forming. It uses standard column clamps for the big columns, but on the smaller ones it saves money by using a steel-strap band. The band is ¾ inch wide and made of cold-rolled steel. It is slipped around the column forms at the wales, grabbed in a ratchet stretcher, tightened, and then clamped in place.

Signode Steel Strapping Co., Chicago, Ill., supplies the strap and stretching and clamping tools. Grimshaw is using this system on columns up to 30 x 30 inches in size, spacing the straps the same way as it would the clamps.

Translucent Material For Structural Use

A new glass-fiber plastic material for structural use has been announced by the Plexolite Sales Co., 4223 W. Jefferson Blvd., Los Angeles, Calif. Plexolite translucent sheet is available in both corrugated and flat surfaces.

Plexolite is said to be shatterproof, weatherproof, non-corrosive, and will not warp, buckle, or sag. The company

points out that it admits light freely while screening vision.

It is available in 12 colors; up to 12 feet in length and 40 inches wide; and in thicknesses of 1/32, 1/16, 1/8, and 1/4 inch. Ordinary tools will readily install it.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 186.

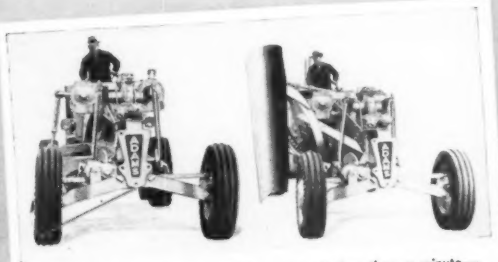
Bethlehem Personnel Changes

Jonathan Jones retired on September 1 from the post of Chief Engineer of Fabricated Steel Construction at Bethlehem Steel Co., Bethlehem, Pa. Ethan F. Ball, formerly Assistant Chief Engineer, Bridges & Buildings, in the Fabricated Steel Construction Division,

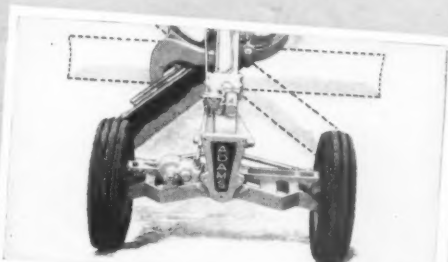
succeeds Mr. Jones. W. H. Jameson, former Assistant Engineer, Bridges & Buildings, takes Mr. Ball's place.

Mr. Jones has concluded a career in steel construction lasting nearly 50 years. Soon after graduation in 1906 he was associated with McClintic-Marshall Co., construction firm, and went into the Bethlehem organization when the company acquired McClintic-Marshall in 1931. Included in Mr. Jones' distinguished career were such jobs as Resident Engineer in charge of the erection of steel-mill buildings at Jamshedpur, India, and the supervision of engineering on the Golden Gate Bridge, the George Washington Bridge, and the Chesapeake Bay Bridge.

Mr. Ball and Mr. Jameson went with Bethlehem from McClintic-Marshall.



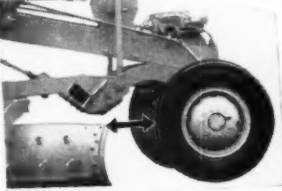
Ditch Cuts to Bank Cuts—or vice versa—in less than a minute—without mechanical adjustments. Saves time on alternate cuts.



Blade Adjustable Under Load—to deliver material where needed on grade balancing work while grader is in motion.



8 Forward Speeds—2 more speeds than most graders—an extra working speed and a higher "high" for transport.



Plenty of Blade Clearance—at tires and all other points. Operator gets all blade positions quickly, easily.



Big, Comfortable Cab—plenty of headroom for a tall man to stand and to see all his work—2-way adjustable seat.

Only ADAMS Gives you all of these big operating advantages

Yes, in Adams Motor Graders you get all of these important advantages—and many more . . . advantages that help your operator to do high-speed, precision work—at lowest cost.

long-life dependability and low-cost maintenance.

Let your local dealer show you how Adams Motor Graders pay extra dividends the whole year around.

J. D. ADAMS MANUFACTURING CO.
Indianapolis, Indiana

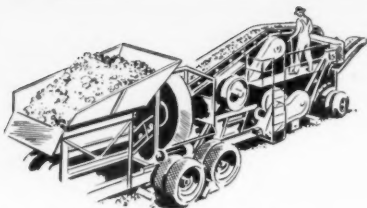
Adams Motor Graders are powerful and husky, too—built with big reserves of strength and stamina for



Make your next motor grader an



for rugged jobs...



Torrington Spherical Roller Bearings are self-aligning. They easily handle the heavy shock loads of rugged construction work.

These heavy-duty bearings are made of the finest materials, to precision tolerances. They are ideal bearings for all types of construction machinery.

THE TORRINGTON COMPANY

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District Offices and Distributors in Principal Cities of United States and Canada

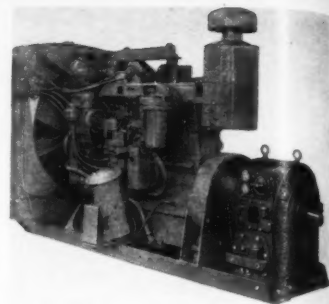
TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

New Torque Converter

Addition of a new model single-stage 3-element-type unit to its standard line of torque converters is announced by The Torcon Corp., 1201 W. Fifth St., Ashtabula, Ohio. Combining a hydraulic torque converter and hydraulic coupling in a single unit, it provides automatic transmission for shovels and cranes, logging machinery, locomotives, rail cars, road machinery, and front-end loaders. This model can be used with gas or diesel engines rated up to 300 hp and is equipped with roller bearings for heavy service.

The Torcon converter has a variable torque ratio up to 3:1. At zero-output speed the torque multiplication is highest, and this gradually decreases with increasing output speed until a point is reached where the output and input torque are equal. Because the engine performs at a practically constant speed during the converter range, overload will not cause stalling. When the torque ratio reaches 1:1, the reaction member



The new Torcon converter has a variable torque ratio up to 3:1.

is free-wheeled and the unit acts as a hydraulic coupling. In the coupling range, output speed increases in nearly direct proportion to engine speed.

Major elements of the Torcon unit consist of the converter pump, converter turbine, and reaction member. For continuous operating efficiency and simplicity of servicing, there are no close tolerances in these elements, which are each single-piece aluminum castings. Piston-ring-type oil seals, which contain the oil in the working elements, permit passage of a small amount of oil to provide continuous controlled bearing lubrication. This controlled leakage drains into the oil reservoir, which is integral with the converter housing. The bearings are designed so that sprocket or gear drive can be attached to the output shaft without the necessity of an outboard bearing.

This unit is constructed for ease of installation and service. The chain-driven oil-circulating pump is mounted on a base plate for accessibility and ease of inspection. The converter uses standard S. A. E. No. 10 motor oil and incorporates a built-in oil filter and temperature and pressure gages. It can be modified to meet the specific requirements of individual applications.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 134.

Truck and Crane Booklet

An 8-page booklet on its line of trucks and cranes has been released by The Baker-Rauling Co., Baker Industrial Truck Division, 1230 W. 80th St., Cleveland, Ohio. A section of the booklet outlines the step-by-step procedure for making the most logical fork-truck choice.

The catalog includes complete specifications, charts, and photos for each model. It illustrates the important construction and design features of Baker trucks, and the latest fork-truck attachments available.

The catalog covers fork-truck models from 1,000 to 10,000-pound capacities; high and low-lift platform trucks in 6,000 and 10,000-pound capacities; crane trucks in 6,000 and 10,000-pound capacities; and the 2,000-pound capacity utility truck.

This literature may be obtained from the company by requesting Catalog No. 54, or by using the Request Card at page 18. Circle No. 187.

Two Baughman Appointments

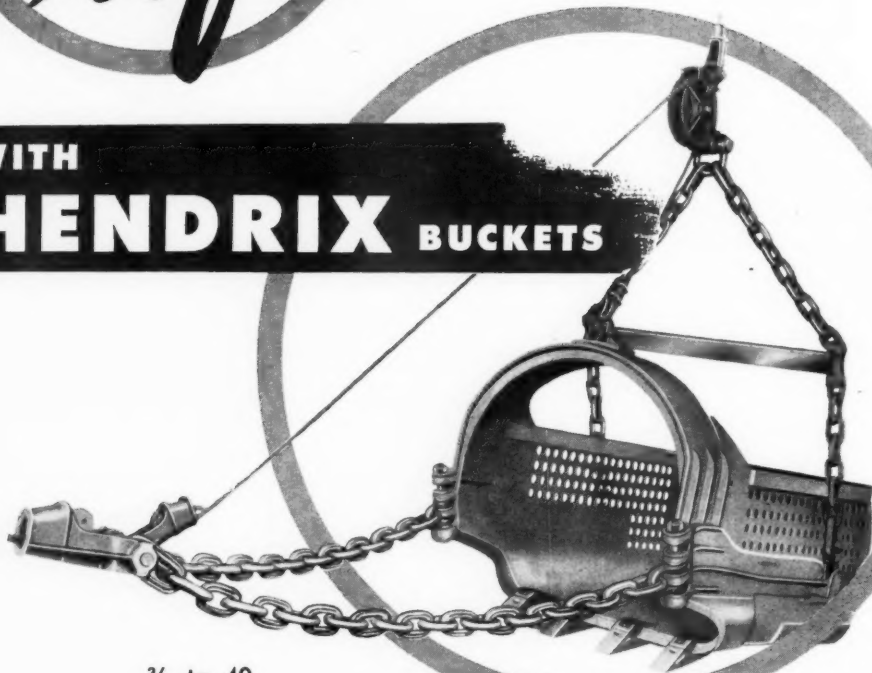
James E. Cadle, former Plant Manager, has been appointed Sales Manager of Baughman Mfg. Co., Jerseyville, Ill., manufacturer of spreading and conveying equipment. He will control his national sales program by flying one of the company-owned Cessnas.

An additional appointment is that of F. Michael Hanlon to the post of Division Manager of the Western Division, which includes 11 states. He has had sales and service experience in helping to establish a preventive-maintenance program for customer equipment.

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Giant Hangar for Stratojets

Cranes and Traveler Erect Umbrella-Like Steel Structure

(Photo on page 1)

EARLY this year U. S. Air Force Plant No. 13, Wichita, Kans., seemed to be the battle area for a war of noise. As construction workers neared completion of a new \$4,500,000 hangar at the Wichita plant, the vibrating chatter of pneumatic riveting guns competed with the overhead roar of America's mightiest air weapon, the Boeing B-47 Stratojet bomber. By the middle of May '52, however, all of the structural steel was in place and only the feeble whir of light drills challenged the high-pitched shrieks of the jets.

Manhattan Construction Co., Muskogee, Okla., held the \$2,579,300 low-bid contract for the construction of the hangar. Boeing Airplane Co. purchased directly the steel, the roofing and siding, and the doors, and delivered them to the contractor. The cost of these items was an additional \$1,980,000.

Nearly 1,000 feet long and 200 feet wide, the hangar is one of the largest in the world. Boeing, designer and builder of the Stratojet, needed the additional enclosed area for flight-line operation on the winged giants at its Wichita plant. Covering an area as large as six football fields, the hangar houses 12 Stratojets at one time. Under the cover of its huge roof flight-line crews prepare the production line 92½-ton medium bombers for delivery to the Air Force.

Steelwork Umbrella

During construction the hangar looked like a giant-sized umbrella rising out of a broad concrete mat. The design of the structure was evolved by Wilson & Co., Engineers, Salina, Kans.

The hangar is 946 feet 2 inches long and 195 feet 5 inches wide. The long axis runs north and south and the structure is symmetrical about this axis. The building contains three main bays, each 263 feet long. These are called Units 1, 2, and 3. At the north end of the building there is a 46-foot-wide boiler-room and cafeteria area. Adjacent to this is a 46-foot-wide area for shops and offices. Next in line are Units 1 and 2 with a 4-foot expansion joint between them. Then there is another 46-foot 8-inch shop area. And, at the south end of the building, Unit 3.

The boiler and cafeteria area and the shop and office area at the north end are two stories high—the first floor 13 feet 3 inches high and the second 13 feet 10 inches. The remaining portion



Once these 44-ton columns were in place, steel crews began assembling the main truss in the air piece by piece.



Hoisting cranes, one with a 90-foot boom and 15-foot jib and the other with a 100-foot boom and a 15-foot jib, lift the trusses.

of the hangar—comprising the principal work areas—is 87 feet in elevation. Clearance below the main truss is 55 feet.

The main support for this area is given by a giant box truss running the length of the building. Two columns at each of the cross-wall sections support the truss. It in turn carries a series of cantilever trusses, 22 feet on centers, which span out an additional 76 feet 6 inches on each side of it. The cross-section at a point between Units 1 and 2 gives the structural frame its umbrella or T-shaped appearance. The two columns at this point are 40 feet apart. Each is composed of a series of built-up members which include two 36 WF 194's, two 21 WF 96's, two 32 x ¾-inch plates, and four half pieces of 10 WF 48's. These columns extend 75 feet, from the base plate to the top of the main truss.

The main truss is in the shape of a huge box 40 feet wide and 24 feet deep. The longest clear spans are 263 feet, over the working bay areas. The chords, vertical struts, and diagonal bracing are all built-up boxes of smaller proportions. The truss weighs about 1 ton per

running foot. It has a 4-inch camber at the center of the long spans. Structural members of the cantilever trusses which span out from the main truss are also built-up units—angle irons and laced channel sections mostly. The purlins spanning the cantilever trusses are 12 WF 27's, 6 feet 5½ inches on centers.

For the roofing and siding the designers selected Galbestos panels with a 1-inch Fiberglas insulation. The working bays have four telescoping canopy doors on each side. These doors are 55 feet high and 66 feet wide and provide full access to the working bays directly from the parking aprons on each side.

Soil Boring Tests

Boeing officials awarded the contract for the construction of the multimillion-dollar building in July, 1951, and work on the initial phases began immediately. At that time they had planned to have the building completed by January, 1952. They didn't reckon with the steel shortage, though, and the half-year delay in delivery meant that the hangar could not be placed in use until mid-1952.

Before the final design of the structure, Boeing contracted for soil-boring tests. Some 30 tests were taken at various points in the site—principally in the proposed areas for the column foundations. Borings, running 10 to 20 feet below the proposed floor elevation, showed a mixture of clay and sand near the surface with traces of gravel below. The engineers agreed on a maximum bearing load of 2,000 pounds per square foot.

Sherwood Construction Co., Wichita, Kans., subcontracted the excavation and grading. Dozer and scrapers handled the grading—taking off about 5 to 6 feet of earth over the entire area—while a backhoe opened up the footing excavations.

Fifty-Ton Floor Loads

Manhattan Construction Co., general contractor on the job, handled all of the concrete work required for the heavy floor slab and foundations. The undercarriage wheel load of the B-47 is about 98,000 pounds; the wheels about 3½ feet apart. To take the heavy load Wilson & Co. designed a floor 15

(Continued on next page)



The completed hangar will hold 12 B-47 Stratojets in its three bays. The covered two-story portion at the left houses the cafeteria, boiler room, and office working space.

A New Giant Hangar Built for Stratojets

(Continued from preceding page)

inches thick, reinforced with a 6 x 6 mesh of No. 4 wire, 2 inches below the surface. It is topped with a troweled-in covering of Masterplate. The hangar floor has a uniform slope of 0.4 per cent from north to south.

The main footing supporting the two columns between Units 1 and 2 is huge by any standards. Containing over 900 cubic yards of concrete, it is 92 x 50 feet in area and 5 feet 4 inches deep. Bottom reinforcing consists of 1 1/4-inch bars 5 1/2 inches on centers in one direction and 1 1/2-inch bars 4 inches on centers in the other. The top reinforcing is made up of 3/4-inch bars 16 inches on centers. Ceco Products Co., Kansas City, Mo., supplied the reinforcing steel for this job, shipping it in by truck. A Unit No. 357 mobile crane did the rehandling on the site.

Concrete forms were made up on the site. A Beach 16-inch table saw and a couple of portable Skilsaws handled the form cutting. The forms were made up of 3/4-inch plywood backed by 2 x 4 studs and double 2 x 4 wales. Some of the plywood form panels were plastic-coated, the others were given an oil coating. Superior snap ties spaced and secured the forms.

Walt Keeler Co., Wichita, Kans., supplied all concrete for the job. The transit-mix trucks—4 1/2 to 8 1/2-yard Smith mixers on White chassis—operated from Keeler's Wichita plant, 8 miles from the airport, and the Connell, Kans., plant just a mile away from the field.

Spex called for a 4,000-pound concrete for the floor slab and a 3,000-pound design mix for the foundation—both had Pozzolite added at the plant. Batch proportions and weights, based on 1 cubic yard, were as follows:

4,000-lb. Concrete for Hangar Floor Slab

Materials	Proportions	Weights
Rock, 2-inch	24 per cent	742 lbs.
Rock, 1-inch	36 per cent	1,112 lbs.
Sand	40 per cent	1,236 lbs.
Cement	5.75 sacks/yd	541 lbs.
Water	5.5 gals./sack	263 lbs.
Pozzolite	1/4 lb./sack	1.44 lbs.
		3,895 lbs.

3,000-lb. Concrete for Foundations

Materials	Proportions	Weights
Rock, 2-inch	24 per cent	764 lbs.
Rock, 1-inch	36 per cent	1,146 lbs.
Sand	40 per cent	1,273 lbs.
Cement	6.0 sacks/yd	470 lbs.
Water	6.0 gals./sack	250 lbs.
Pozzolite	1/4 lb./sack	1.25 lbs.
		3,904 lbs.

Wherever possible, Manhattan's concrete crews chuted the batch directly into the forms. Two cranes—a Unit and a Northwest—with 3/4-yard Gar-Bro buckets handled the long pours. The load lines were fitted with a hook so that one bucket could be filled while the other was making a pour. A couple of Mall and Jackson gasoline-powered vibrators worked the concrete in and around the maze of reinforcing steel in the big footings. The crews handled the floor-slab pours in the same way. Expansion joints separated each of the working units in the hangar. Dummy joints, 21 feet 6 inches on center, ran completely across the width of the building. Keyed construction joints, 25 feet on centers, ran the length of the building. Load transfer assemblies at the joints were 1-inch deformed bars 30 inches long, 30 inches on centers, placed halfway down. The filler for the dummy joints was a special Air Force-approved jet-resistant mastic. Workmen set the wire-mesh reinforcing when the pour was within 2 inches of the final floor elevation.

Manhattan crews made up their own screed supports—1/2-inch pointed rods with a tack-welded wire "ear" supporting a 1-inch-pipe screed rail. Three Whiteman finishers topped off the concrete floor surface after the crews had



Steel crews guide the first of the huge columns into place. The 54 x 47 x 4-inch base plates are secured to the footing by six 3 1/4-inch round rods and four 1 1/4-inch rods.

applied a layer of No. 1 white Masterplate. The Masterplate was put on at a rate of about 1 1/4-pound per square foot and troweled into the concrete surface.

Daily pours ran about 400 to 600 cubic yards. The size of pour was held down during cold spells so that the finishing could be completed before nightfall. Sisalkraft paper covered the slab during the curing period. Manhattan also laid about 4 inches of sand over this so that the floor would be protected during the steel erection.

Traveler Sets Steel

John F. Beasley Construction Co., Muskogee, Okla., subcontracted the erection of the structural steel and the placement of the roofing and siding. The steel gangs moved into the job December 26, 1951. First job was setting column base plates. The plates for the cross-wall column varied in size. The big ones, of course, were for the two main-truss columns at each cross-wall. They were 54 x 47 x 4 inches in

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size, set on a 3/4-inch grouted leveling base, and secured to the footing by 10 anchor bolts—six 3 1/4-inch round rods and four 1 3/4-inch rods. The six large bolts were anchored deep into the column footings.

Beasley brought in one of its shop-made travelers for the erection of the large columns and the main truss. The traveler is designed to ride on rails 55 feet apart. Its front leg is 60 feet long, the rear leg 30 feet long, the center stem 55 feet long. The frame is made up of stiffened I-beams. The 110-foot vertical mast, centered in the front leg, is braced by a stiffleg secured to the rear leg, and by four 2-inch wire-rope guys tied down to the ends of the front leg. The 100-foot boom is fitted with a 35-foot jib fixed at a 45-degree angle with the boom. The traveler carries three load lines and a boom line. An American 4-drum hoist powered by a Cummins diesel engine is mounted on the center stem; swing control drums are set on each side.

Mosher Steel Co. fabricated the 5,600

tons of steel required for the hangar. The Dallas plant supplied the big members; the Houston plant the other steel members. Steel came right to the airfield by rail. One of Beasley's large cranes placed the big members on a White truck and Hobbs flat-bed trailer to get them over to the hangar site. A Chevrolet and a GMC truck with tail-mounted A-frames and Tulsa winches handled all of the other members.

With the 44-ton columns for Unit 1 in place, Beasley's crew started erecting the main truss at the north end. The main truss was assembled in the air, piece by piece. Crews filled approximately 50 per cent of the rivet holes with pins to secure the members during erection. Fifty-five-foot steel towers, 53 feet apart, supported the main truss during erection. When the truss was completed down to the next cross-wall, riveting crews started the final connections.

Erection of the main truss continued over Unit 2 as the riveters worked

along. When the main truss was completely secured over Unit 1, Beasley brought in its heavy cranes for erection of the cantilever trusses. The cranes were a Koehring 604 with a 90-foot boom and 15-foot jib, and a Koehring 1005 with a 100-foot boom and 15-foot jib. Both cranes had a wide crawler base and heavy counterweights to handle the cantilever trusses. Beasley also used a Koehring 304 truck crane for some of the lighter work on the job.

The cantilevers naturally had to be balanced on each side of the main truss—one side not to be more than two trusses ahead of the other. To keep moving from one side to another to a minimum, Beasley set two on the east side, then four on the west, four on the east, four on the west, and so on. As each cantilever truss went into place, the steel crews set all purlins and the top and bottom-chord cross bracing. The total weight of steel over each of the large working bays was about 750 tons.

Beasley moved from north to south working over the three long spans in the same manner for each. Steel went up at a rate of over 1,000 tons per month:

January	1,200 tons
February	1,200 tons
March	1,000 tons
April	1,400 tons
May	800 tons

Total: 5,600 tons

The last cantilever went into place May 5, 1952.

To keep up the erection pace, Beasley had up to six riveting crews. They used various riveting guns—all 90 psi. A Worthington 350-cfm and two Ingersoll-Rand 160-cfm's supplied the air power. The rivets were heated in Champion and Buffalo hand-fired coal forges. Most of the rivets (80,000) were 3/4 x 2 1/4 inches; the largest were 7/8 x 7 1/4 inches. The entire structure required 222,000 rivets. The daily production of the crews varied widely—250 to 700 per day.

The steel came to the job with a shop coat of red lead. As soon as the steel erection was complete it was given a coat of white enamel paint.

The Galbestos corrugated panels for the roof and sides were set following the steel erection. Black and Decker 1/4-inch drills opened holes in the sheeting and the purlins or girts. Then a Robertson drive screw was shoved in the hole and driven in tight with a hammer.

Last job was setting the telescoping canopy doors. The doors, which weigh 48 tons apiece, were supplied by International Steel Co., Evansville, Ind.

Personnel

Total work force on this job ranged up to 180 men, working six 9-hour days per week. F. R. Harris, General Superintendent for Manhattan Construction Co., was in charge of all construction forces. Homer Rosser headed up John F. Beasley's erection crews. R. E. Snow was Field Engineer for the general contractor. L. R. King, of Wilson & Co., was Project Engineer, representing the owners.

Construction Toys

Contractors who think it's a good idea to break their sons into the business at an early age will be interested in new additions to the line of construction toys made by Ny-Lint Tool & Mfg. Co., 1823 Sixteenth Ave., Rockford, Ill.



The company has now introduced a scale model of the Hough Payloader. The unit can be worked by itself or with the Model Tournarocker and Tournahopper. The No. 1600 Payloader's bucket is raised by a crank and dumped when a catch is tripped. The unit is made of heavy-gage steel, it is 18 inches long, 7 inches wide, and 7 1/2 inches high. The front wheels steer.

The company also makes a toy grader, street sweeper, and pump-mobile.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 166.

Represents Davey in Mideast

Andrew V. Chandler has been appointed Mideastern Regional Manager for Davey Compressor Co., Kent, Ohio, manufacturer of portable air compressors. He will be in charge of company operations in eastern New York, eastern Pennsylvania, and New Jersey.

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Left: A Caterpillar D8 with No. 28 ripper rips the shale bed on the U. S. 61 relocation job. Right: A DW21 with No. 21 scraper is push-loaded by a D8 with a push plate. A. L. Alley was the contractor on the dirt portion of the job.

Shale Is a Problem In Highway Grading

The presence of ledge or Decorah shale aggravated an already tough job for A. L. Alley & Son, Roseau, Minn.,

contractor on the dirt portion of a highway-relocation job. The job was the relocation of U. S. 61 at Red Wing, Minn., a 2-mile stretch with a 300-foot right-of-way. Considerable cut work was needed to bring the road to the

desired grade, and the shale made things worse.

Alley used Caterpillar DW21 wheel tractors and Caterpillar track-type tractors as well as No. 12 motor graders in a 600-yard-long x 100-foot-wide cut through yellow clay that was wet and sticky due to an underlying bed of rock. Though there was a favorable grade for loading as well as for the haul road, the machines encountered a 3 per cent adverse return grade into the cut. The total yardage on the job was 300,000 cubic yards.

The project will provide a four-lane divided highway, and access roads will parallel the main road.

New Haven Plant for Wenzel

A new finishing plant has been completed by H. Wenzel Tent & Duck Co., St. Louis, Mo., manufacturer of FlameZel and RainZel tarpaulins. Located in New Haven, Mo., the building contains



equipment which has substantially improved the FlameZel and RainZel processes by providing a uniformity of quality control. One feature is a high-temperature curing oven for continuous processing with temperatures up to 350 degrees F and air velocities of 80,000 cubic feet per minute. The tarpaulins undergoing this process are more dur-

able, according to the company. Another advantage offered by the plant is the increased capacity which will mean faster delivery service—particularly significant with tarpaulins be used for emergency protection during inclement weather.

Excavators and Truck Cranes Covered in Three Booklets

Three new specification booklets on the ¾-yard Models 75A and 75B excavators and the 75BT truck crane have been released by Gar Wood Industries, Inc., Wayne, Mich.

They illustrate capacities, working ranges, and dimensions. To help contractors select the right unit for the job, the booklets contain additional information on power plants; the right angle drive, an efficient method of power transmission; and travel systems and controls.

This literature may be obtained from the company, or by using the Reader Card at page 18. Circle No. 188.

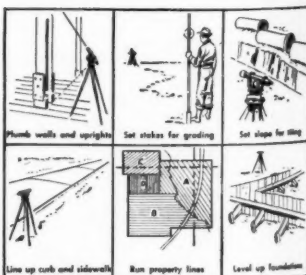
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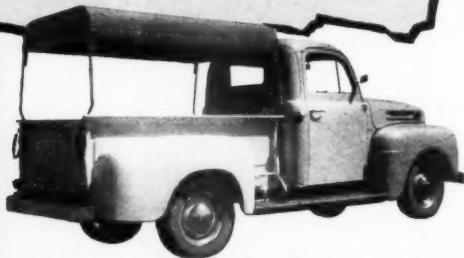


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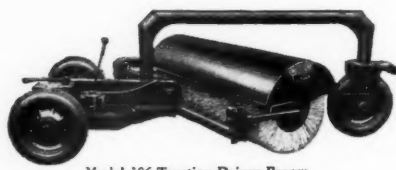
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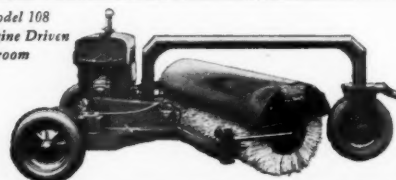
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Model 106 Traction Driven Broom

Model 108 Engine Driven Broom





The Deming pump in action. Here it is hooked up to a tank and tractor tire.

Tire-Filling Pump

A centrifugal jet pump for liquid-filled tractor tires is offered by The Deming Co., Salem, Ohio. The unit is simply submerged in the liquid; there is no hose or stuffing box required. The motor is the standard capacitor type, 110 volts and 60 cycles.

The discharge hose connects the 4-way valve and jet to the tire-core ejector for evacuating air or water from the tire and also for filling. A pressure and vacuum gage is also furnished. The entire unit fits any standard 50-gallon drum.

The company points out that liquid-inflated tires provide greater traction than air-filled tires and also increase drawbar pull.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 189.

A 7½-Volt Hand Lamp

A new 7½-volt-powered hand lamp which may be used either indoors or outdoors is made by General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa.



The Model 22 is fitted with a rubber grip handle, 2-way fingertip-switch control, 3 cp on low beam and 21 cp on high beam. (Sealed beam available). It has a non-corrosive aluminum bracket, chrome-plated head and reflector, and 6-inch adjustable head.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 190.

Data on Dry Brick Walls

Specifications and type of workmanship for keeping brick walls dry are covered in two booklets put out by Louisville Cement Co., 501 S. 2nd St., Louisville, Ky.

The booklets illustrate step-by-step bricklaying techniques and give detailed instructions. Causes of leaky walls are listed, together with preventive methods.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 111.

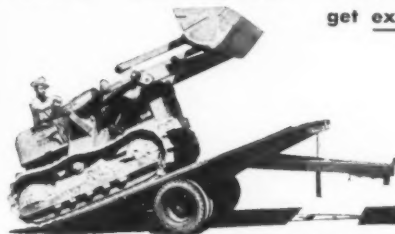
Air Reduction Sales News

Air Reduction Sales Co., a division of Air Reduction Co., Inc., New York, N. Y., manufacturer of welding and cutting equipment, has appointed two new District Managers. A. S. Blodgett,

Jr., former Manager of the Boston district, has become Manager of the Pittsburgh district in place of the late S. D. Edsall. Succeeding Mr. Blodgett in Boston is E. S. Twining, Jr., former Assistant Sales Manager of the company's Philadelphia district.

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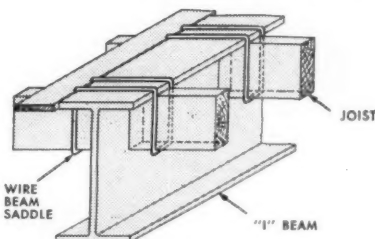
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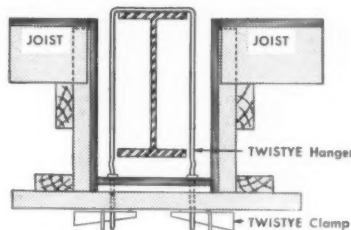
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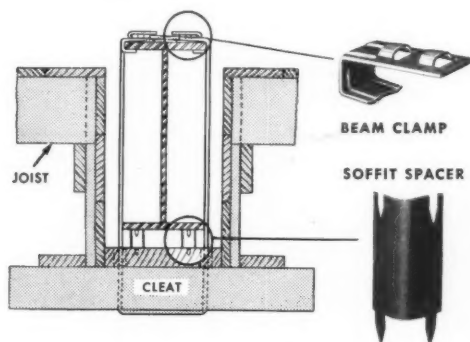


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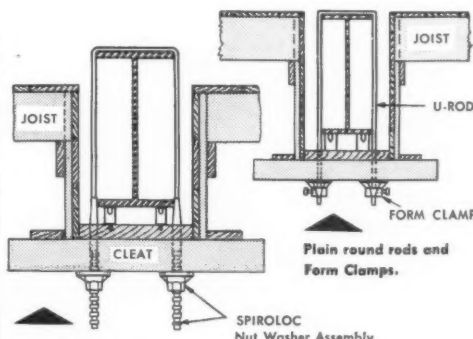


2 TWISTEY Hangers—For fireproofed construction . . . accurately fabricated to provide a positive spreader . . . guaranteed breakback . . . easy installation, quick removal.

3 Beam Clamps with Band Iron and Soffit Spacers—For fireproofed construction . . . Beam Clamp has a double grip on Band Iron which develops the band's full strength. Soffit Spacers act as spreaders. Installed from above . . . no scaffolding necessary.



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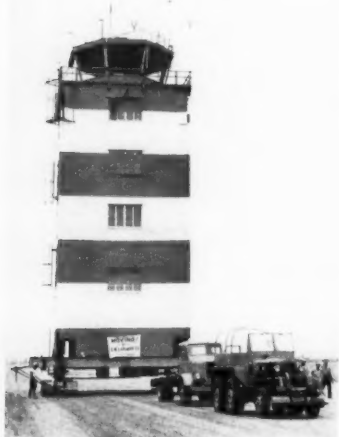


Moves Control Tower More Than One Mile

Air Jacks Raise a 68-Foot 110-Ton Traffic-Control Tower: It Travels On Truck-Drawn Dollies

• THE construction of new runways for an airport sometimes leads to difficulties that were not envisaged when the airport was built. This was the experience of Miami International Airport recently, when it was decided that the 3-year-old traffic-control tower was dangerously close to one of the new 9,000-foot runways. The Port Authority of Dade County, Fla., decided that the best thing to do was to move the 68-foot 110-ton tower to a safer place over a mile away. The structure—one of the most modern of its kind, containing \$100,000 worth of instruments—was too valuable to scrap. Its removal has saved the County more than \$100,000.

The contract for this delicate job was awarded to E. W. LaPlante Co., Indianapolis, Ind., on a low bid of \$32,000; Kenneth Adair, head of the company, directed operations. One main runway was closed less than an hour during the moving, and less than that on an intersecting strip. A temporary tower directed traffic for two weeks on all runways of this busy airport while the



Off she goes! Miami International Airport's 68-foot traffic-control tower is towed along a 9,000-foot runway. E. W. LaPlante Co., Indianapolis, Ind., handled the moving.

change was being made. The entire project was supervised by Rader Engineering Co., Miami, which also prepared plans, specifications, and engineering data.

Preliminary Welding

The first step was to remove sections of sidings at each corner of the steel control tower. Then two 21-inch I-beams were placed 5 inches outside of the exterior columns. Steel plates, 9 inches wide x 21 inches high and 1 1/4 inches in thickness, were welded vertically to the column flanges at each corner, extending into the web of the 21-inch beams.

The two 21-inch beams tied with 15-inch I-beams were also welded into place. Steel rails, rollers, and shoes were put under the column footings on two sides. Then the building was moved 50 feet into an adjacent street.

Raised by Air Jacks

Air jacks were placed under the beams at each corner just outside of the footings and held in place on the beams with 5/8-inch plates to fit the head of the jacks. The four 100-ton-capacity jacks were manufactured by the Joyce-Cridland Co., Dayton, Ohio. These jacks, operated by two 105-foot Schramm compressors, raised the building 4 inches on each side alter-

nately until it was high enough to receive dollies at each corner. LaPlante's shop-made dollies have been used by the company on numerous occasions. Each is made to hold a maximum of 100 tons. Each has four 24-inch steel wheels and a 5-inch axle. Rigged by a cross bar, they are steerable in motion.

From the street the tower was moved slowly, by careful winching, to the airport runway on a slight down grade. Two and sometimes three trucks were required to anchor the winch. On the runways, two trucks towed the structure. Only once was it necessary to winch the haul around a turn. Then

the tower was moved flush against the new 20-foot concrete base. Jacks were set and the dollies removed.

Cribbing consisted of 6 x 6-inch timbers at the corners, supported by 12 x 12-inch timbers crosswise the length of the structure. The air jacks raised the tower 4 inches on alternate sides and followed this up with 6 x 6 and 12 x 12-inch cribbing until it was high enough for the column bases to clear the new anchor bolts which had been installed previously atop the new two-story base.


Realignment Called For

At this point, steel rails, rollers, and

plates again went to work to move the tower into position over the final location. Then it was discovered the structure had crept 7 inches out of line during the last 5 feet of raising. Rollers had to be placed so the structure could be lined up true above column base plates.

The cribbing was then knocked down and reassembled around the base. Air jacks were set once more, the rails and rollers removed, and the tower lowered to its new position.

More as a psychological effect for the workers than an added safety measure, Adair ordered guy cables run from the top of the building to anchors cemented

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into the ground. The main purpose was to overcome a worker's fear of danger if he happened to glance up and get an erroneous impression seeing clouds drifting by, but at the same time, these concrete anchors were of sufficient size to tie the tower down against any wind. The cables were paid out as the structure was raised.

Specialist in the Unusual

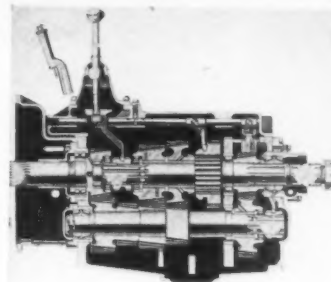
For more than 50 years LaPlante has specialized in moving unusual things. It has transported numerous water towers and several entire towns. Last year the company raised a 1,500-foot bridge 17 feet over the Savannah River at Lin-

colnton, Ga. (See C. & E. M., Sept., 1951, pg. 19.)

A New Transmission

A new transmission for use with torque converters, designed for off-the-highway trucks up to 400 hp, is announced by the Fuller Mfg. Co., Kalamazoo 24, Mich. The 4-FS-1440 is said to feature smooth load pickup and climbing; elimination of shock load on engines, drive lines, and axles; and operator ease.

The new transmission adds to the flexibility of the torque multiplication offered through the converter, the com-



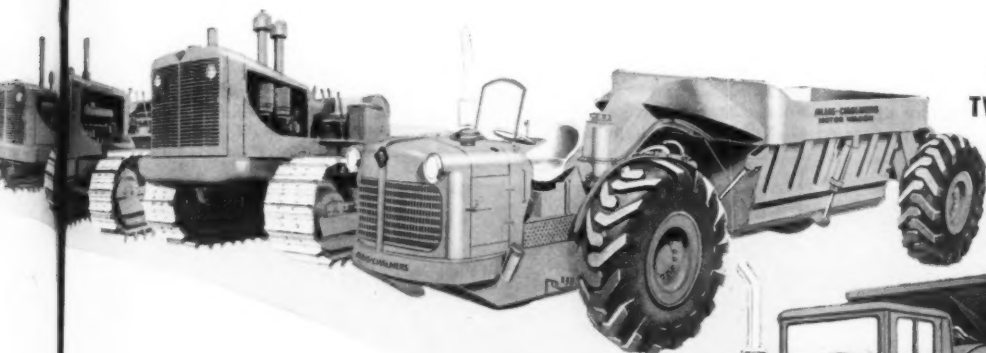
pany says. With four closely spaced forward speeds, operators have an

ample selection of gears to match the widest range of operating conditions. Ratios in the four forward speeds are 1.98; 1.40; 1.00; and 0.71. Reverse is 1.61. The clutch housing size is SAE No. 1. Weight is 775 pounds.

The 4-FS-1440 has two SAE standard large power takeoff openings, and may be fitted with speedometer gears. Oil capacity is 14½ quarts.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 191.

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TW-300 MOTOR WAGON

Bottom Dump

14 cu. yd. struck capacity
280 hp.

TR-200 MOTOR WAGON

Rear Dump

11 cu. yd. struck capacity
176 hp.



TS-200 MOTOR SCRAPER

10 cu. yd. struck capacity
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TS-300 MOTOR SCRAPER

14 cu. yd. struck capacity
280 hp.

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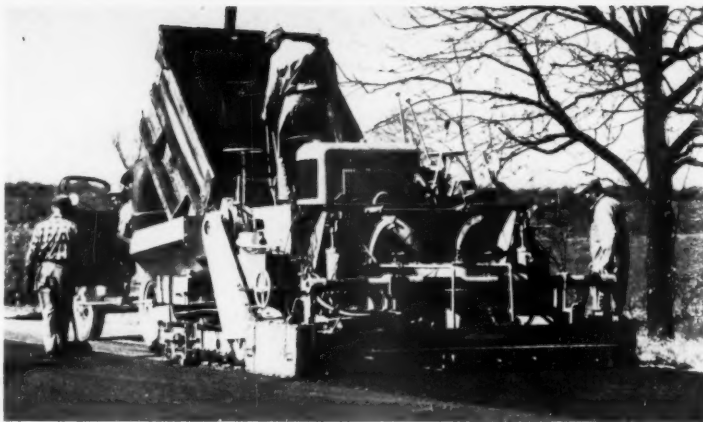
Bituminous Paver Can Adjust Width Without Stopping

A new bituminous paver that can adjust its width while in motion is now being produced by Pioneer Engineering Works, Inc., 1515 Central Ave., S. E., Minneapolis 13, Minn.

The Model BP-6 can lay widths from 5 feet 6 inches to 12 feet 6 inches without adding or removing any parts. For any widths between 9 feet and 12 feet 6 inches, the turn of a hand wheel extends or retracts each rear screed up to 21 inches without stopping the paver. This action permits simpler paving of variable width curves and also makes it possible to lay 25-foot pavements in 2 lanes without special attachments.

The BP-6 has eight working speeds from 5 to 50 fpm and four travel speeds from 1/2 to more than 2 mph.

The center screed, with serrated beveled front edge oscillating at high speed, works and presses material into a



The BP-6 adjusts its width from 5 feet 6 inches to 12 feet 6 inches.

5-foot-6-inch-wide mat with proper thickness and crown. Hydraulic rams hold rear screeds to the same level. Rear screeds lay the balance of mat in the same manner as the center screed.

A floating edge plate is said to leave a clean vertical or beveled edge on mat that blends and seals with the edge of the adjacent lane.

Other features pointed out by the

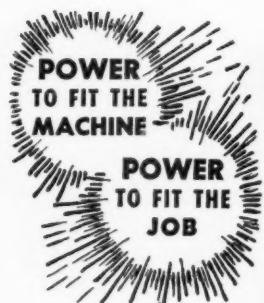
company are the crawler traction for pushing fully loaded trucks, ability to pave flush to curb, and burnproof screed heating with a hot-air system. The company claims that the paver will lay up to 50 fpm of thick mat 12 feet 6 inches wide.

Further information may be secured from the company by requesting Form No. 633. Or use the Request Card at page 18. Circle No. 174.

Templeton-Kenly News

Templeton, Kenly & Co., Chicago, Ill., manufacturer of Simplex mechanical and hydraulic jacks, has consolidated its New York domestic and export offices. E. A. Zimmerman, former Manager of the city's domestic sales, will direct both operations in new quarters at 60 E. 42nd St., Room 2119, New York, N. Y. Long associated with Simplex jacks sales and service, he will continue to serve Simplex distributors and users in the New York area and will expand personal contacts in the export field.

WISCONSIN-Powered Joint Cleaner Helps Prepare WRINKLE-FREE Runways



Powered by a 13 hp. Model TF 2-cylinder Wisconsin Heavy-Duty Air-Cooled Engine, this Model "G" Tennant joint cleaner, manufactured by the G. H. Tennant Co., Minneapolis, Minn., prepares airport pavement joints for re-sealing. The machine routs out shrunken old seal, pebbles and dirt, refacing side-walls at the same time.

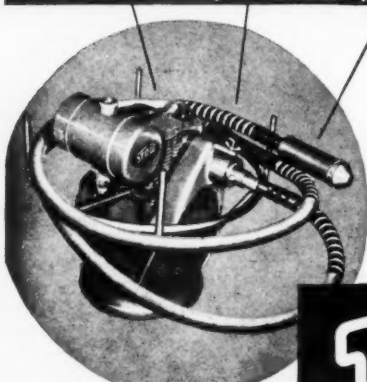
Helping to prepare smooth, "wrinkle-free" runways is another typical power service application in which Wisconsin Air-Cooled Engines fit both the machine and the job. You can't do better than to specify "Wisconsin" for any purpose that requires dependable engine power within a 3 to 30 hp. range.



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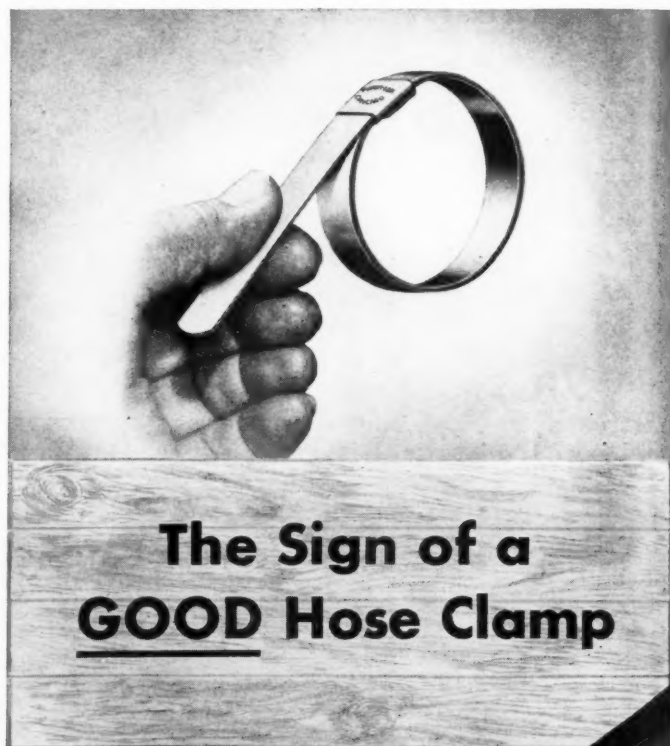
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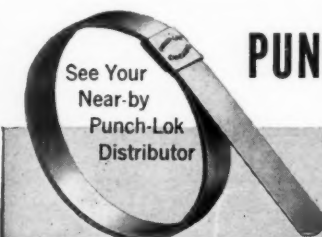
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Grading Eliminates Bad Curves on U. S. 40

Rock and Dirt-Moving Crews Carve Through Mineola Hill To Relocate Main Highway Across Missouri

• **BATTLING** almost incessant rains early in the year, a major state-wide strike in the spring, and an abrasive sandstone that was rough on equipment, R. G. Aldridge, Kansas City, Kans., kept his \$724,854 contract for the relocation of U. S. 40 on schedule. The job was one of the most important Missouri State Highway Department projects undertaken this year. The new 3-mile relocation through Mineola Hill replaces a tortuous winding ribbon of concrete that for a long time had been extremely prone to accidents.

U. S. 40 is the main highway across the state of Missouri and a vital traffic artery connecting Kansas City and St. Louis. The relocation of this section is part of the State Highway Department's over-all program of widening and improving its most important road.

State Adds Creeper Lanes

Originally the contract called for two 12-foot driving lanes. Later this was changed to provide for an additional 10-foot truck creeper lane on the two main grades—one section 4,850 feet long, the other 10,250 feet long. Shoulders are 10 feet wide, except where they adjoin the truck lane. Here they are reduced to 4 feet. Fill slopes on the new road are 4 to 1 up to 10-foot heights, and 2 to 1 over this. Back-slopes under 10 feet are 3 to 1, and over this 2 to 1. Ditches on both sides are a standard 2-foot-deep V-ditch.

Aldridge's contract includes the paving—a uniform 8-inch portland-cement concrete slab, unreinforced, on a 4-inch rolled-stone base. The surface has a 1½-inch parabolic crown. Shoulders slope ½ inch per foot. There are no expansion joints in the pavement; contraction joints are on 20-foot centers. The dummy tongue-and-groove longitudinal joint is tied with 30-inch-long dowels 30 inches on centers.

Specially Abrasive Sandstone

Clearing the right-of-way was done in the summer of 1951. A Cat D8 dozer

handled all of the work. All timber and brush were burned.

The grading was started in November and December of '51. Warren Martin, General Superintendent of Aldridge's crews, worked the grading from the ends of the project toward the center. The east end of the job contained most of the rock. Estimated quantities, before the widening work was added, ran about 275,000 yards of dirt, 62,000 yards of rock, and 27,000 yards of sandstone. Two Gardner-Denver wagon drills



C. & E. M. Photo

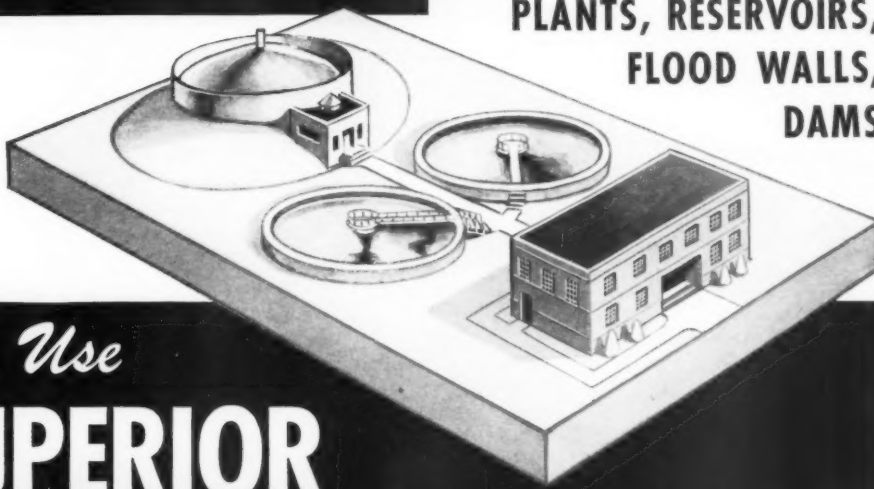
A Tournapull Super C with a D8 as pusher loads up in the borrow pit. Stiff soil, like that rising out of the scraper pan, made the grading rough.

and one G-D hand-held drill did the drilling. Most of the rock was taken off in 12-foot lifts. The deepest rock cut

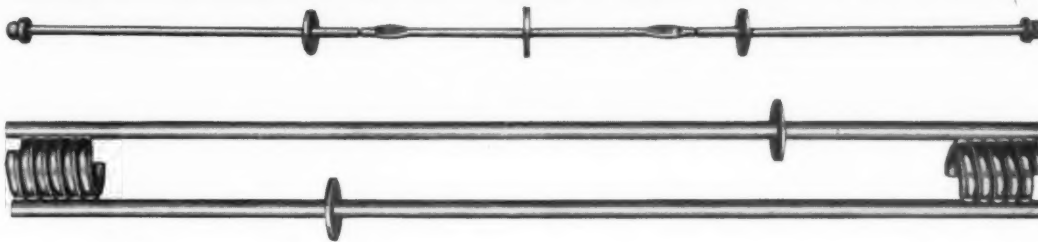
was about 29 feet. Holes were spaced approximately 13 feet apart in both (Concluded on next page)

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Superior Water Seal Snap Ties, and Coil Ties, both stand-

ard and Cone-fast, are provided with a water stop in the form of a securely fixed washer near the middle of the tie as illustrated. This washer effectively breaks the continuity of the rods, preventing seepage along the tie.

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Grading Eliminates Bad Curves on U. S. 40

(Continued from preceding page)

directions. The wagon drill used 1¼-inch round steel; the hand drill, 1-inch rods. The bits were Timkin multi-use in sizes ranging from 2 to 2¾ inches. In rock, Martin got about 300 feet per bit, but in sandstone, only 120 feet. The sandstone dust was extremely abrasive and cut behind the bit.

For the blast, sticks were Illinois 55 per cent strength. The number varied from 8 to 25 per hole, 20 being about the average. Illinois delay caps—Nos. 0, 1, and 2—assured a clean breakaway from the slope. Average firing was about 100 holes. A Northwest 80-D shovel with a 2½-yard bucket worked the rock face and loaded into a fleet of 5 Koehring WD-60 Dumpsters. Production ran approximately 1,500 cubic yards per day over an 800 to 900-foot haul. All rock was used in the fill sections. A Cat D8 spread the rock.



C. & E. M. Photo

A double-section sheepfoot pulled by D8's compacted the fill on the Missouri State Highway Department grading job on U. S. 40.

Rains Slow Earth-Moving

Earth-moving was a sporadic operation due to heavy rains. When the

weather was good, though, Aldridge's scraper teams moved out 5,000 yards a day. There were 3 Tournapull Super

C's, 2 LaPlant-Choates, and 3 Gar Woods on the job. The rubber-tired Tournapulls averaged 12 loads per hour with about 8½ yards in each load. Two Cat D8 crawlers acted as pushers. The LaPlants and Gar Woods handled 10 yards per load and moved out 9 loads per hour. This was under very difficult loading conditions. Average hauls ran about 900 feet.

Two D8's, each pulling a 2-section sheepfoot, and two Caterpillar No. 12 graders leveled and compacted the fill. A brand new water truck stayed brand new. The rains supplied all the moisture needed, too much in fact. Waiting for the pits to dry was the big problem during the spring.

Later on, when things had just begun to go well, the laborers went on strike in Missouri. Fortunately, though, Aldridge had a crew of old-time tractor and scraper operators on the job and work went on behind the picket lines. Erection of a 5,832-foot bridge near the center of the job stopped, however.

Class 3 excavation around the bridge and culverts, etc., was handled by a Bucyrus-Erie 10-B with a ¾-yard Hendrix dragline bucket. One field service truck—a Chevrolet carrying a Graco grease gun and compressor—and two pickups for the mechanics kept all machinery on the job in A-1 working order.

Personnel

Construction crews were directed by Warren E. Martin, General Superintendent for Aldridge and an old-time earth-mover himself. When things were going at a fast pitch and the scrapers were eating dirt out of the borrow pit faster than new areas could be cleared, Martin hopped on a D6 and cleared trees and brush to keep the job moving.

J. H. Glen was Project Engineer for the Missouri State Highway Department. V. B. Saville is Division Engineer in the project area, and Rex M. Whitton is Chief Engineer of the Department.

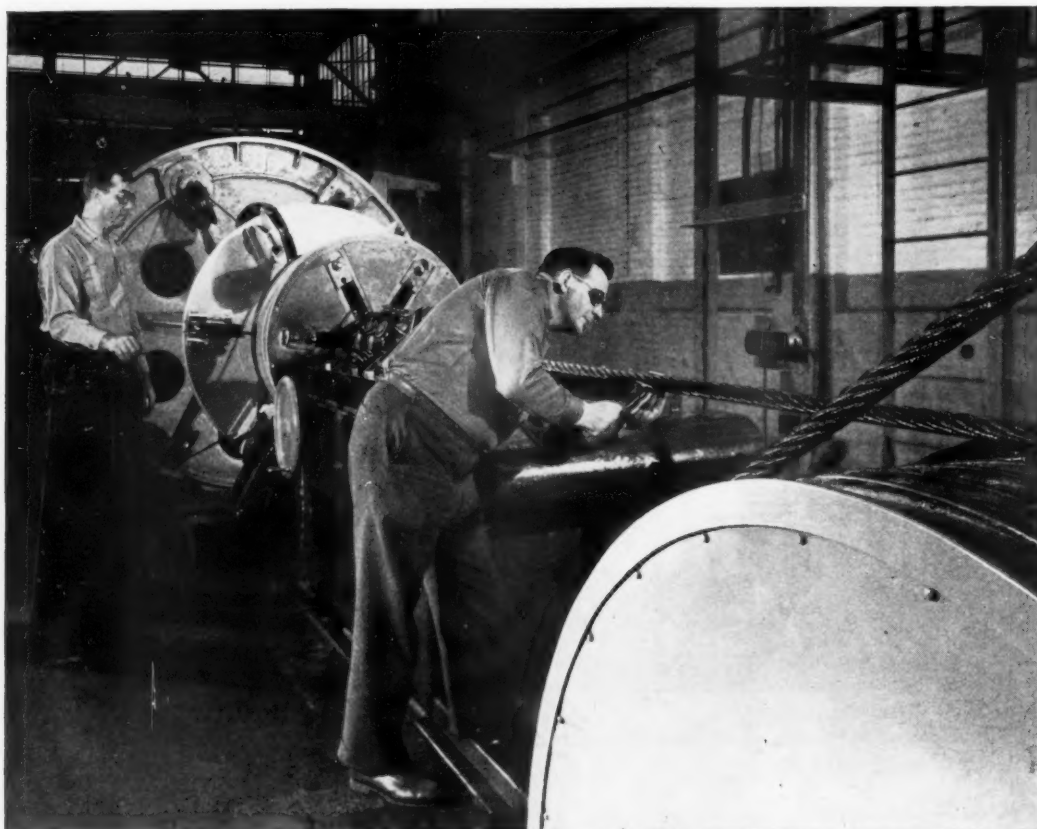
RR Head Urges Better Roads

All forms of transportation should get together, each in his proper place, to get on with the job of handling American goods, according to Abraham Watner, President of the Wisconsin Central Railroad and head of the American Transfer Co., a trucking firm in Baltimore, Md.

In a talk to the Milwaukee Transportation Club, he gave full backing to the current campaign for better roads and attacked restrictions currently hampering American transportation. He laid down the following two-point program: (1) End unreasonable ICC regulations that hamper railroads; (2) End unreasonable state limits on weight, length, etc., that hamper trucks.

In his dual capacity as railroad and trucking executive, Mr. Watner has found that transportation in America is indivisible and cannot be cut into little pieces without hurting the whole system. He feels it is imperative that the highways improve as fast as the vehicles that use them.

"Today our civilization rests on the cooperation of all members of society," said Mr. Watner. "This cooperation is particularly true in the field of transportation."



Here a big wire rope emerges from Bethlehem's 66-in. closing machine. At this stage of the checking, the inspector is making sure that the diameter is within specified tolerances.

He seldom has to say "No"

Saying "no" can be part of the Bethlehem rope inspector's job. Fortunately, he seldom has to use the veto power, for Bethlehem rope is made with such care that rejects are few. But the inspector won't hesitate to stop a rope if even a minor detail is subject to question.

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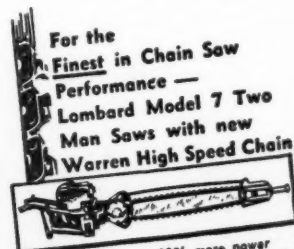
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Commuting by Air Beats Traffic Jams

Two operating engineers working on the atomic-energy plant which F. H. McGraw & Co., New York, N. Y., is building at Paducah, Ky., have found a way to beat the 8,000-car traffic jams that beset the project every morning and evening. They fly over them.

Each morning Ray McCluskey, crane operator, and Laverne Phillips, high-lift operator, leave their homes in Car-

terville, Ill., 85 miles away, drive two miles to the airport, take off, and arrive at the project 40 minutes later (25 minutes with a tail wind). They have found that flying is just about as cheap as driving, too. Their Piper Cub, purchased secondhand for \$300 uses 6 gallons of aviation gas at 28 cents per gallon, while most cars take 5 gallons, not to mention 2½ hours, each way.

McCluskey, the pilot, who claims he can almost see his home after taking off at Paducah and climbing 1,000 feet,

learned to fly in 1946 under the G. I. Bill of Rights; Phillips, who shares expenses in the plane pool, had been in a plane only once before. Since they began their aerial commuting in June, the two craftsmen have been grounded by weather only once. Then they reverted to the old-fashioned automobile.

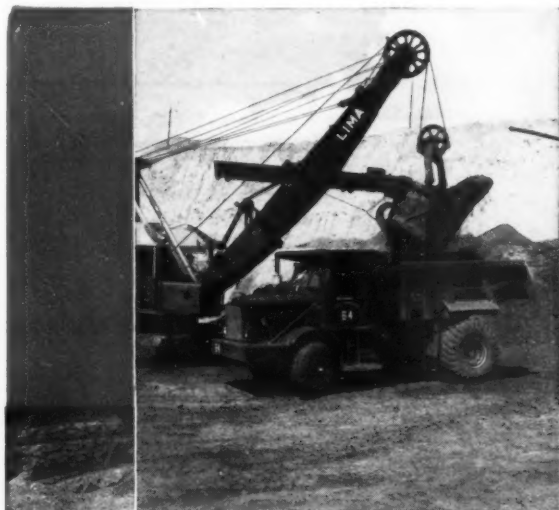
Vice President for Turner

N. B. O'Connell has been elected a Vice President of Turner Construction

Co., New York, N. Y. Formerly General Superintendent in the New England territory, he has been transferred to the New York City office and now has general management of all projects handled by that office. Mr. O'Connell, who has been with Turner since 1920, served as General Superintendent on the Air Depot at Rome, N. Y.; as Manager of Operations on the Higgins Aircraft project in New Orleans, La.; and as Project Superintendent on the General Cable contract at Rome, N. Y.

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North Carolina Equipment Co., P. O. Box 880, Greenville; P. O. Box 1205, Charlotte; Sweeten Creek Rd., Asheville; P. O. Box 128, Guilford; P. O. Box 635, Wilmington.
NORTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.
OHIO—The W. W. Williams Co., 835 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 2; 1280 Conant St., Toledo (Maumee).
OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.
OREGON—Intermountain Equipment Co., Boise, Idaho.
P. L. Crooks & Co., 2145 N.W. Pettygrove St., Portland.
PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Bendard Equipment Co., 122 Marion St., Wilkes-Barre; Westburn & Lycoming Sts., Williamsport.
L. B. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenue, Philadelphia.
RHODE ISLAND—Clark-Wilcox Co., Boston 34, Mass.
SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.
SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.
TENNESSEE—Euclid-Memphis Sales, Inc., 125 E. Butler Ave., Memphis 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 900 W. Manning St., Chattanooga.
TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2.
Unify Equipment Co., Albuquerque, New Mexico.
UTAH—Fauler Equipment Co., 1361 So. 2nd West, Salt Lake City 8.
VERMONT—Clark-Wilcox Co., Boston 34, Mass.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 29th and Kilian Ave., Norfolk.
Kai Equipment Co., 1605 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Norfolk 7.
WASHINGTON—Philpott Equipment Co., 373 Dexter Hotel Building, Seattle 4, Washington.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., E. 611 S. Agave Ave., Spokane 5.
WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh.
Euclid Equipment Co., Kanawha Blvd., Charleston 22; East on U.S. 80, Clarksburg; P.O. Box 169, Bluefield.
L. B. Smith, Inc., Philadelphia, Penna.
WISCONSIN—Cunningham-Ortmeyer Company, Milwaukee 48; Eau Claire and Green Bay.
WINNING—Constructors Equipment Co., Denver 5.
Fauler Equipment Co., Salt Lake City 8, Utah.



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Move the Earth



A Mechanized Office Builds Good Profits

Accounting System on a Tunnel Job Saves Time, Personnel, and Money. Says M-K Office Manager

• DRIVING the twin-bore Broadway vehicular tunnel through San Francisco's Russian Hill would have been a tremendous construction job ten years ago. It's a big job today, but the modern methods, techniques, and equipment employed by Morrison-Knudsen Co., Boise, Idaho, on the \$6,000,000 project greatly increase the efficiency of earth-moving and construction operations and reduce the time required to ready the tunnel for the safe and rapid movement of vehicles.

Throughout Morrison-Knudsen's world-wide construction operations, which find M-K men engaged in proj-

Figure A shows two forms. The left form is a 'TIME TICKET' for Daniel C. Butler, dated 7/1/58, showing hours worked and rates. The right form is a 'COST-DISTRIBUTION STUB' for the same date, showing various cost codes and amounts.

Figure A. The combination time tickets and cost-distribution stubs are shown at the left, alongside the combination check register and payroll journal prepared on the Burroughs typewriter-accounting machine. Daniel C. Butler is Morrison-Knudsen's Office Manager.

Figure B shows a 'PAYROLL JOURNAL AND CHECK REGISTER' for Morrison-Knudsen Company, Inc. It includes columns for employee names, rates, hours, and check numbers. The right side shows a 'CHECK REGISTER' with columns for check number, date, and amount.

ects ranging from boring the Eklutna power tunnel in Alaska to building the Gal Oya Dam in Ceylon, modern methods provide the basis for efficient operation. But M-K's progress has not been confined to the methods and techniques of construction, to the exclusion of other aspects of the business. On the Broadway Tunnel job, Daniel C. Butler, M-K Office Manager, supervises highly efficient accounting operations which make a major contribution to the success of the whole project.

"Under today's business conditions," says Butler, "time means money more than it ever has in our industry. The office manager can help the company by devising more efficient methods and short cuts that save money in the face of increasing labor and material costs. The contribution of the office is reflected significantly in the profit and loss sheets for every job."

Office Staff Halved

When he came on the Broadway Tunnel project two years ago, Butler found that he could expect to have close to 400 men on the job at its peak. Under accepted manual-accounting methods a job this size could normally require an office manager, an accountant, a paymaster, an assistant paymaster, two timekeepers, a voucher clerk, and a secretary-receptionist. But under the mechanized system the peak load was handled with only four people in the office—a secretary-receptionist, a paymaster, a voucher clerk, and the office manager himself—and one timekeeper in the field. "And we had plenty of time to do our work," says Butler.

"With the job working three shifts, six days a week, our office worked only 5 days, with no overtime. During a peak month we handled disbursement of \$526,000, processing 630 payable invoices, issuing 1,475 payroll checks,

drawing 242 voucher checks, issuing 183 purchase orders, processing accounts-receivable invoices, and preparing 45 journals—a total of 1,475 postings. Still, the whole office operation has been handled at a total clerical

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—the **VIBRATOR**
THAT USES ITS HEAD!

The Vibro-Plus ROLLGEAR vibrator head steps up low shaft speeds to high vibrating speeds—11,000 to 15,000 per minute.

Because it vibrates at such high speed, Vibro-Plus compacts concrete more effectively, more rapidly, more economically.

Because motor and shaft speeds are low, a smaller motor may be used—shaft life is longer—maintenance is less. Thus you get more effective, more dependable performance—at lower operating cost. ROLLGEAR is the reason—and only Vibro-Plus has this patented vibrator head. Write for bulletin and nearest distributor.

TYPE ER5B is electrically operated, using a 1 HP 110/220 V. single phase or 110/220 V. 3-phase fully enclosed motor on a swivel or skid base. 20 or 30 ft. flexible shaft connects with snap coupling, and can be lubricated in 15 seconds even while running. The ROLLGEAR head is available in 1½", 2½" or 2¾" diameters. Shaft and head can also be used with gasoline or pneumatic drive. Grinding attachments available.

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PRODUCTS, INC.

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WOODSIDE, L. I., NEW YORK

Eliminate 70% to 90% of Conveyor Downtime



EVERYTHING is contained INSIDE the pulley shell!

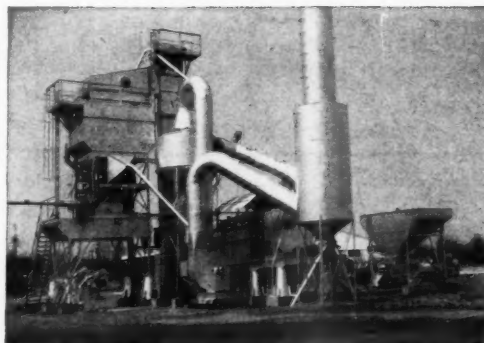
HERE'S a money-saving departure from conventional conveyor drives. A Cedarapids-Schrock Motorized Head Pulley is simply a new application of the long-proven gear reduction drive, with everything... electric motor, reduction gears and all moving parts... contained inside the drum, completely protected from grit, dirt and weather and with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime is saved by eliminating the exposed parts necessary with conventional pulley drives. In operation, the pulley shell rotates about

the electric motor which is held stationary by a torque arm attached to the conveyor frame. The speed of the shell depends on the combined reduction ratio of the pinions and gears inside the shell. Compact, easy-to-install, job-proved Motorized Head Pulleys are available in sizes from 5 to 30 HP and in various widths. Find out all the advantages of converting your belt conveyor or belt-bucker elevator installations to motorized efficiency before you need head pulley replacements. See your distributor today, or write for Bulletin MP-1.

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CLEVELAND 14, OHIO

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A Mechanized Office Builds Good Profits

(Continued from preceding page)

formation posted to these cards includes the document number, date, vendor, or other description of the entry, amount of charge, subsidiary-account number, and control-account number. Thus (Figure B), Document No. 6875, June 30, to George Philpott in the amount of \$75.26 applies to subsidiary account 8 15 5 and control account W 8. This information also appears as a carbon copy on columns 1 through 6 of the general-journal sheet. "From an accounting standpoint," explains Butler, "the permanent carbon record on the journal would permit discarding the cost-distribution cards. However, we index them and file them by account and subaccount number for engineering cost analysis when and if it is required."

As illustrated in Figure B, the general journal also carries carbon impres-

sions of voucher checks and stubs—prepared by computing and summarizing the cost-distribution information on the machine—which serves as a record of voucher invoices and as a check register, giving a running balance each week when invoices are paid. The machine operator (the paymaster) enters each invoice for the same company on the upper section of the voucher check and columns 8 through 12 on the general journal. When all invoices in a run are entered, the check portion of the voucher check is aligned and the check number, date, and check amount are entered on the check, appearing as a carbon entry on the journal. When a page of the journal is completed the machine prints subtotals and proves the page totals.

After all vouchers and journals have been entered by the machine operator in the general journal at the end of the month, a memo journal is prepared from the control worksheet. This worksheet closes the general journal and provides the single source of entry to

the general ledger. The cost-ledger subsidiary data are posted directly from the control worksheet, with the cost-distribution cards representing the detail.

The process Butler uses to obtain control figures consists of preparing a quantity of these worksheets bearing all of M-K's 79 general-ledger and 902 subsidiary-account numbers. He then runs a tape recapping all cost-distribution cards by account numbers and posts the total opposite the correct account number on the worksheet. The worksheet is then totaled and balanced with the machine total for control. "This method provides good control" he says. "Sorting the cards manually takes about 4.5 seconds per card. It

takes 7.5 seconds to post and balance these on the worksheets and 5 seconds to file them by accounts and subaccounts. However, as long as we are filing these cards for engineering cost analysis anyway, the actual handling time required for the control operation is only the 12 seconds it takes to sort, post, and balance each card on the worksheet."

This posting is done to the worksheet each week (the sheet is divided into columns for each week in the month) and then the total for each account number is obtained at the end of the month, so it is only necessary to post one amount for each account number to the general ledger at the end of the month. "The control-worksheet job

TWO GREAT VIBRATORS FOR GENERAL CONCRETE CONSTRUCTION!



Model FS-6A. Now furnished with a 6 H.P. engine, providing plenty of reserve power under all conditions, and vastly improved power take-off. Vibrator frequency (up to 7500 VPM) and amplitude are carefully balanced for maximum progress and thorough consolidation. It is available with 3 vibrator heads, for thick or thin sections. Shafting is furnished in 7' and 14' lengths up to 28'. Quickly adaptable to concrete rubbing, wet or dry, and drilling. Built to stand severe usage. By any comparison, it's the finest engine-driven vibrator on the market and the best buy! Complete details on request.

The POWERFUL, LIGHTWEIGHT JACKSON ELECTRIC VIBRATOR



2 1/4 H.P. MOTOR. FAST — RELIABLE

Has more than ample power for uninterrupted placing of the stiffest mixes, even when using the maximum length of shaft (28'). Provides 8,000 to 10,000 VPM. Built for trouble-free service.

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Wherever 115 volt, 60 cycle, single-phase AC or DC is available.

EXTREMELY HANDY

May be had with any length of shaft up to 28' and choice of 3 vibrator heads. And since it weighs but 50 lbs. it is ideal for thin or thick sections, high places and reaching those otherwise difficult-to-get-to spots. Also ideal for incasing structural members and similar applications.

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Ever wonder why you never see a scowling, fagged operator on the Baker, A-C team? Here's why:

They just plain love that "doze-in-your-armchair" ease of control; that positive hold without throttle jockeying; that fraction-of-an-inch accuracy . . . that quick, direct lift; that positive down-pressure which puts almost all the tractor weight on the cutting edge; and the "roll-action" of the blade which leaves more tractor power for push. Because "Easy DOZE It!"

That's why you see the Baker, A-C team more and more wherever dirt has to be moved fast and efficiently. When operators prefer it, you can count on it being the best money-maker.

Specify Baker Bulldozers, Gradebuilders or Root Ripers for your new A-C Tractors . . . Baker makes engine-mounted hydraulic control models and cable-control models for the entire line of Allis-Chalmers crawlers. See your Baker, A-C Dealer. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.



P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

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Now Even Better

would lend itself admirably to machine posting, too," says Butler. "We started the manual-ledger system on this job before the machine was installed, so I've kept it that way, but starting a new job I would do it all by machine."

Time Saved Is Considerable

It has been found that cost-distribution cards and voucher checks can be written on the machine much faster than the old method of recapping the accounts, typing the vouchers, and then typing separate checks. All hand posting of current detail is eliminated and only one journal is hand posted at the end of the month. The savings in time have exceeded all expectations.

In the first month of its installation the machine handled 40 journals, 576 invoices, 214 voucher checks, 1,378 cost-distribution and 1,099 payroll checks. During the same month the total accounting time involved (excluding preparation of clearing and amortization journals at the end of the month) was only 11 hours and 25 minutes. This included sorting cost cards, posting and balancing the control worksheet, filing the cost cards by account and sub-account, closing the control sheet, preparing and posting the journal, and closing all transactions. In addition to this time saving, there were additional minor time savings in preparing end-of-the-month allocations, clearings, etc. Total time saved in this way was 5 hours.

The month-end peak, involving the preparation of a comprehensive financial cost-and-revenue statement for the main office in Boise is considerably cut, too. The total time spent in preparing this statement and handling postings and closings in all the accounting, exclusive of work done on the machine, takes only 30 hours a month.

Equipment-Maintenance Costs

Butler has also devised an unusual system of cost accounting for equipment. Mechanics' and shop overhead charges are both charged to the shop. The foreman's daily report shows the total hours each mechanic worked, by items of equipment on which he spent his time. These hours are posted to a spread sheet daily, and at the end of the month the total shop cost can be divided by the total of these hours to get the hourly cost rate. This rate, which now includes overhead, can be applied to the various equipment groups to get the monthly cost of maintaining equipment.

Over-All Advantages

The whole system of short cuts and mechanization in construction accounting means an impressive saving in time, personnel, and money, Butler believes. The time savings free personnel for additional work and enable them to do all their work less hurriedly, with more accuracy. The reduction in personnel required amounts to more than enough salary saved to pay for the machinery in a year. "I believe that timekeeping, payroll, and accounting time," he says, "has been brought down to an almost irreducible minimum by the new systems. At the same time, they have provided a more detailed and accessible system for cost analysis and there is the advantage of having all transactions recorded in detail on one document—the general journal. With the construction industry making such giant strides in finding new and better methods and equipment, it is up to the office manager to keep abreast of the latest methods and machines and employ them to maintain the efficiency of the office on a level with that of the actual construction work."

Truckstell Regional Sales

Truckstell Mfg. Co., Cleveland, Ohio, manufacturer of Truckstell-Baumis Dual-Axle drives used to convert

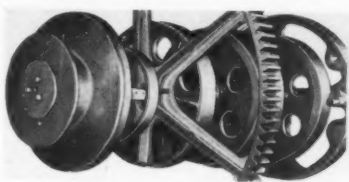
standard trucks to six-wheeler units, has appointed three regional sales managers. They are: Raymond L. Page, for the west coast; C. F. Weeks, for the midwest; and James N. Brown, for the east coast.

A Magnetic Tagline

A magnetic tagline for use on clamshell or electro-magnet services has been announced by The Osgood Co., P. O. Box 515, Marion, Ohio. Mounted on the extension of the hoisting-drum shaft, the tagline consists of a drum provided with a series of permanent magnets. By their magnetic attraction to the flange of the tagline drum, a constant pull is exerted on the tagline rope. Different pulls can be obtained by varying the number of magnets, on the job.

The unit features permanency, no adjustment, and no maintenance. It is said to be an improvement over track-type taglines, or those requiring clutches, springs, and other parts.

Further information may be secured



from the company. Or use the Request Card at page 18. Circle No. 125.

Hard-Facing Guidebook

The rebuilding and hard-facing of all types of heavy equipment is covered in a revised guidebook issued by Stoodly Co., 1136 W. Slauson Ave., Whittier, Calif.

This literature may be obtained from the company, or by using the Request Card that is bound in at page 18. Circle No. 164.

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ALL-PURPOSE GRADER
DITCHER & TERRACER



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Finishes slopes and ditches better and faster. One man hydraulic job recommended for contractors. Guaranteed against breakage first year. Three sizes \$540 to \$1570. Will save you a lot of money.

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keep equipment rolling

on Newark Airport Project

Union Building & Construction Co. of Passaic, N. J., is constructing a 7000 ft. runway and adjoining taxi strip at Newark Airport between the present runways and Kill Van Kull. The job involves moving over 900,000 cu. yds. of dirt and sand, and laying 40,000 ft. of concrete pipe—all on a fast schedule.



THIS is a rush job—the kind of job on which contractors don't take chances with their equipment. They want smooth, dependable operation and the best insurance they can buy against costly mechanical delays.

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and arrange to use Gulf quality lubricants and fuels on your next job. They are quickly available to you through 1400 warehouses in 31 states from Maine to New Mexico.



Dam Builder Fights



Drillers work a Gardner-Denver wagon drill. Zone and slope lines are painted on the right abutment.



Working against a heavy bank, this Bucyrus-Erie 54-B shovel is mucking overburden off the right abutment. Four 11-yard Euclid end-dumps were used to haul the bedded knobs of solid rock.



Congestion . . . inevitable in any highball operation like Lexington Dam, is shown here as equipment works deep in the dam base. Pockets of fill such as this were a delaying factor in the rush program.



A section of one of the steep haul roads leading from the spillway cut to the dam. That's a TD-24 pulling a scraper.



Rock, shale, boulders, and heavy digging called for heavy ripping in places. A Caterpillar D8 is pulling a heavy ripper through the spillway cut.



Conventional sheepsfoot rollers work on the base of Lexington Dam as a TD-24 scraper dumps fresh material in the background.

Ray Day Photos

CONTRACTORS MONTHLY Serious Time Limit

Was a Race Against Winter Rains for Guy F. Atkinson Co.:
Uses Big Equipment Fleet to Build Lexington Dam

A \$1,500,000 fleet of heavy equipment, representing an investment as big as the project to which it was assigned, was thrown into "the battle of Lexington Dam" near Los Gatos, Calif., by Guy F. Atkinson Co. of Los Gatos. Winter rains start December 1, so the danger was that the dam—an earth-fill barrier—might be overtopped by high waters on Los Gatos Creek.

Working under pressure, however, was nothing new to an outfit which had battled time at McNary and Rock Island dams, Dorena Dam, and many a high-way job. At the time CONTRACTORS AND ENGINEERS MONTHLY visited the job, enough of the initial delays and obstructions were over and it was the solution to a mathematical problem the rest of the way. That mathematical problem consisted of 500,000 cubic yards of dirt a month. It had to be placed in a steep narrow gorge and hauled over roads with grades as steep as 18 per cent.

Santa Clara Water Conservation District engineers designed and planned the dam, which will store some 25,000 acre-feet of runoff water on Los Gatos Creek for percolation use during the summer irrigation season. It is, however, not an irrigation dam. Its function is to capture flood waters—which reach the San Francisco Bay in the rainy season—and temporarily store them, for release in the spring and summer to the gravelly stream beds below. These allow the water to percolate to natural underground reservoirs, thus building up the overtaxed water table of the Santa Clara Valley. It was realized that the dam would have to be built in a single construction season, and the company made its \$1,487,000 contract bid on that basis. Construction work began in May, but several heartbreaking delays cut at least a month off the effective working time. There was a delay during preliminary work while an existing domestic pipeline was relocated, causing extensive additional work on the right abutment. A 150,000-cubic-yard slide on the left abutment, after it had been accepted,

was the cause of more extra work.

Earth-Fill Design Used

Lexington Dam is an earth-fill structure of four zones, set across a narrow gorge where Los Gatos Creek necks down to a rather narrow closure about 2 miles south of the town of Los Gatos. The dam has a crest length of 830 feet, is 195 feet high at its highest point, and has an abnormally broad base due to a 5½-to-1 slope on the upstream face. The nearby country is deficient in rip-rap rock, so the dam was built strong at its base, with a relatively flat slope, to minimize pressures and wave action.

The four zones consist of a random

(Continued on next page)



Once each shift this mobile service unit fueled and greased every piece of equipment. One of the TD-24's and a Willamette roller get the treatment in this picture.

We Engineered the Mechanical Advantages Of Big Shovels into the Dempster-Diggster

The Dempster-Diggster's ability to dig hard and stratified materials without shooting is shown in photo at right. Note ample loading clearance. Dempster-Diggster, shown at work in Florence, Ala., is the Type GRD, Model 100.



This Dempster-Diggster, shown at work in Creighton, Pa., is also loading hard and stratified material without shooting. It is the Type CR, Model 100.



The Type GRD, Model 100-HL is shown above loading Hopper Bottom car, height of which is 10'8" from rail to top of car.

Simultaneous Independent Hydraulic Crowding and Hoisting, Variable Crowd Action at Any Dipper Position and Changeable Buckets are engineered into the Dempster-Diggster. Many of the present Dempster-Diggster owners were at one time in the same position you may be in today. They needed front end loaders, but they also needed shovels that could dig out 15 to 18 foot banks. The versatility of the Dempster-Diggster, plus its economical and efficient operation, left them with only one choice. In the first place, the Dempster-Diggster can do anything a conventional front end loader can do—and do it faster and at less cost! Second, on big jobs the Dempster-Diggster is without equal for working in tight places. The Dempster-Diggster is available in either of two types of traction—pneumatic (Type GRD) or crawler (Type CR). Both types are supplied in two models—the Standard (Model 100) or High Lift (Model 100-HL). Our new catalog No. 1032, with over 35 illustrations and complete specifications, shows how this revolutionary shovel can cut your costs tremendously. For your copy fill in the attached coupon and mail today!

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Please send me, without obligation, your Dempster-Diggster Catalog # 1032.

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Drills **6 inches of concrete per minute!**

... gives lowest cost per foot of concrete drilled with a TILDEN Rotary Konkrete Kore Drill. Two-thirds more cutting surface make Tilden 70% more efficient. Drills 5 to 7 times more holes without resharping — even reinforced concrete. Free factory resharping! Use with any electric or air drill. 29 standard sizes, 3/16" to 4". Interchangeable shanks up to 60".

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Dam Builder Fights Serious Time Limit

(Continued from preceding page)

upstream zone, a thick impervious center zone, a rock-drain zone, and a ballast zone.

Organization Important

The selection of an organization of key men, together with their assignment in the most efficient manner, was critically important right from the start. Some of Atkinson's best men were brought in from many parts of the United States. They were all men who were used to working under enormous pressure.

Grant P. Gordon was selected as Project Manager for the "hot seat", with Frank Anderson as his assistant and Hank Quade as Project Engineer. Immediately under Gordon, but spread out over the day, swing, and graveyard shifts were E. M. Daly, Wayne Wootton, and Ernest Gressot. Otis Rolling, a



Dirt foreman Lee Reid, day-shift super E. M. Daly, and project engineer Hank Quade on the Lexington Dam job.

wizard with modern equipment, was assigned as Master Mechanic. Walt Butler as Storekeeper and Ed Hunt as Office Manager completed this key setup, and the best equipment operators it

was possible to get were brought in, because many of the pioneer cuts and haul roads had to be constructed on near-dangerous grades. One haul road from the spillway cut, for example, rose 180 feet in a distance of 800 feet.

Equipment

Because of the critical time limit, Atkinson's South San Francisco office realized that an enormous amount of heavy construction equipment would have to be selected and brought in. As early as April, many units scattered as far away as Hood River, Oreg., were being worked over and mobilized for shipment to the rush job of the year. One of the important factors governing the selection of equipment was the possibility of pouring earth fill into the dam from three locations: the spillway cut and two main borrow areas.

The main tractor fleet for peak operation consisted of 17 International TD-24's and 10 Caterpillar D8's. As a general rule, the TD-24's were assigned for pulling scrapers, for pusher tractors, and for towing heavy pneumatic and sheepfoot rollers on the dam. The Cats were assigned for pulling rippers, for general bulldozing work, and for pioneering and stripping abutments. The companion scraper fleet to this tractor spread consisted of a fleet of ten No. 80 Caterpillar machines, whose capacities have been extended to 22 cubic yards heaped (14 cubic yards bank measure) by the addition of sideboards. This tractor and scraper fleet is being used principally for spillway excavation and abutment stripping.

Longer-range equipment for hauling between the borrow pits and the dam included 8 Caterpillar DW20's and 4 Caterpillar DW10's. For rock loading and hauling, there was a 2½-yard 54-B Bucyrus-Erie shovel and 4 Euclid 11-yard end-dump trucks. The dam is sufficiently close to the San Andreas seismic fault for occasional bedded knobs of solid rock to be found, and the power shovel and trucks were a permanent fixture practically until the end. Drilling and compressor equipment ahead of the combination included 4 Gardner-Denver wagon drills, 6 jackhammers, two 500-cfm Gardner-Denver compressors, and a 105-cfm Gardner-Denver machine.

For processing earth fill and dressing haul roads there were three No. 12 Caterpillar motor graders; a Sterling-mounted 3,000-gallon water truck; and two truck-mounted units of 1,500 and 2,000 gallons respectively. The motor graders especially were important on the haul roads, because as tires become larger and more expensive, it is becoming more and more important to eliminate any loose rocks on the roads. Regular blading by the machines did

much to extend tire life; in fact, the Atkinson organization considered it not the least bit unusual to get as high as 3 recaps and 1,700 hours of service life out of its big earth-moving tires.

For blending earth and moisture on the fill there was a scarifier mounted on a Caterpillar dozer. Compaction equipment included 6 double-drum sheepfoot rollers and 4 single sets of 60-ton pneumatic compactors. The latter were made by Willamette Iron & Steel Co. of Portland, Oreg., an Atkinson subsidiary. All were pulled by International TD-24's.

Abutments, Outlet Works Start Job

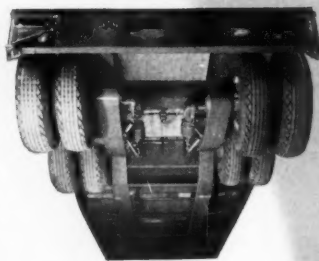
Very little clearing stood in the way when the contract was let, and the first operations included abutment stripping and the installation of a concrete-coated, steel-lined conduit 50 inches in diameter to carry the normal flow of the stream to an outlet exit below the dam. The latter turned out to be a problem and another source of delay, because it called for a design change

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The rear end design of the Type "T" has proved so efficient it has been adopted as standard construction in Rogers Power-Lift Detachable Goose-neck Trailers.

By reason of its versatile adaptability to all kinds of heavy hauling jobs, the Rogers Type "T" has steadily increased in popularity.

It's a "natural" for small and large contractors and haulers. If you are considering the purchase of one or more trailers, by all means investigate the Type "T".

It packs powerful advantages in a multi-purpose single unit. Write for full details and catalog.

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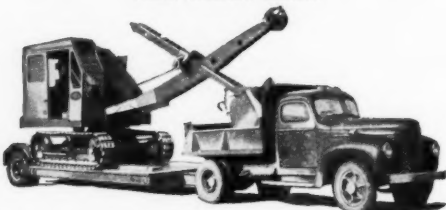


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WIRE ROPE SHEARS

These sturdy units, with either independent or integral pumps, are useful for many jobs in construction and maintenance. Capacities from 20 to 500 tons.

W-S wire, cable and bar shears provide years of trouble-free general service. They are light and portable for convenient on-the-job use.

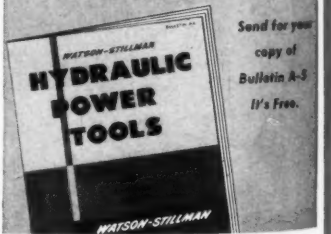


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HAND PUMPS

Bends all standard, extra heavy and double extra heavy steel pipe from ¾ in. to 2 in. inclusive, as well as standard weight pipe up to 3 in. diameter. Also handles solid mild steel bars up to 2 in. diameter.

Single and double plunger types, with reservoirs of different capacities to suit the job, these hand pumps have a wide application for operating small hydraulic tools, jacks and other hydraulic equipment, and for general hydrostatic testing purposes.



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ROSELLE, NEW JERSEY

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to get it down to the bottom of the stream bed.

The right abutment was pioneered from the top by Caterpillar-mounted dozers, which worked down gradually and exposed the foundation material. In general, Lexington Dam's abutments and foundation are a hard blue shale and sandstone. As the dozers shoved the material off to expose the blue rock, the loose material was loaded out either by scrapers, a Northwest ¾-yard backhoe, or by the 54-B Bucyrus-Erie.

The left abutment was stripped almost in its entirety by the 54-B and the fleet of Euclid trucks, working from benches established by the dozers. After it had been completely stripped, inspected, and accepted, a 150,000-yard chunk slid 26 feet downhill about midnight one night, and all this loose material then had to be cleaned up. The slide was removed in an extended concentrated effort—and the work so coordinated as not to interfere with the progress of the 54-B shovel. The material was both stockpiled and incorporated in the fill.

The concrete-encased outlet had originally been planned for a higher location, but last-minute design changes placed the greater part of the pipe as low as possible down in the bottom of the stream bed. A ditch had to be blasted out by the compressors and wagon drills, and mucked out by a Northwest backhoe, and considerable ground water had to be pumped before the pipe was finally in and cased. When that part of the work was finished, the job had been delayed—so far as high-speed embankment fill was concerned—about a month.

While the outlet pipe was being installed, the stream flow was carried through the upstream zone of the dam through a corrugated metal pipe laid low against the foundation rock. Afterward, when the outlet pipe was finished, an earth-fill cofferdam forming part of the finished structure was built to divert the stream through the permanent-outlet opening. The temporary corrugated metal pipe was then plugged with slurry and a portion in the upstream end of Zone 1 left in the embankment.

Excavation and Fill Methods

There are many interesting aspects regarding both excavation in the borrow pits and fill on the dam at Lexington. Not the least interesting is the manner in which the TD-24 tractors extended the potential economic haul of the scrapers. By climbing up the steep grades in just one gear faster than normal, and by taking a few seconds less to load in the pits, they made the scrapers perform more efficiently on a

haul of any length, but particularly the longer ones.

Drilling and blasting, also, was of considerable interest. Most of the rock was soft, so ordinary Timken rock bits did the work nicely. In case hard rock was encountered, however, there were enough tungsten carbide bits to meet any condition economically.

Because of the seamed and broken nature of the rock, column loading was generally practiced, and the shots of 20 and 40 per cent powder are pulled with electric caps and a blasting machine. The size of shots was never great, because the material which required drilling and shooting was spotty as to location. A policy of loading, hauling, and placing material directly in the dam without secondary stockpiling was generally followed.

Loaded equipment at the peak of operations roared down on the fill from three directions. As the machines dumped their loads in loose layers about 7 inches thick, dozers and motor graders quickly bladed it level. Water

trucks hauled from a nearby standpipe at the diversion cofferdam, where two Fairbanks-Morse turbine-type pumps were stationed. Loading time was short because of the relatively great capacity of these pumps. After the necessary moisture was added, the lifts were scarified several times, and then rolled. Both sheepfoot and pneumatic compactors were used, and in the case of pneumatic machines, the dense surface was scratched lightly before the succeeding lift was added.

Santa Clara Water Conservation District engineers have their own way of determining proper densities. It is a modification of the old Proctor method. Their requirements, however, are quite strict and sound, and the embankment was put together to dense specifications, because for many months out of the year Lexington Dam will have to hold back an impounded lake about 2½ miles long and 180 feet deep at high water.

No core wall was placed between the embankment and the foundation, but

that problem has been taken care of almost automatically by Mother Nature. Particularly down in the stream foundation, numerous deep gouges and holes were made to get down to solid rock. As these are filled to develop the base of the dam, a natural keyway results.

It was the beginning of September before the main base of Lexington Dam had been established, where all the equipment units could be brought to bear with maximum efficiency. Up to that time, it was a battle every day with the laws of equipment economics, congestion, and tough grades. The elevation differential at the start of the work, for example, when dirt from the spillway cut was placed in the bottom of the dam, was about 190 feet.

Equipment Maintenance

An excellent program of preventive maintenance was used to make sure that all the equipment units were kept on the line and digging. Two TD-24's were generally used as standbys. Once

(Concluded on next page)

Pennsylvania contractors prefer DAVEY Compressors!



In Pennsylvania, as in other states, leading contractors rely on Davey Compressors for all types of construction and maintenance work.

Every Davey Compressor is equipped with Permanent Peak Efficiency lifetime valves. These never carbon or foul . . . do not require cleaning or replacement . . . keep tools operating at full capacity.

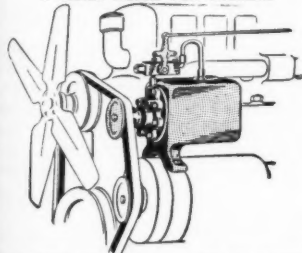
A-6019

Davey Model 315 Diesel in service of D. Dinardo, Inc., on Banksville Circle Job, Penn-Pitt Parkway, near Pittsburgh.

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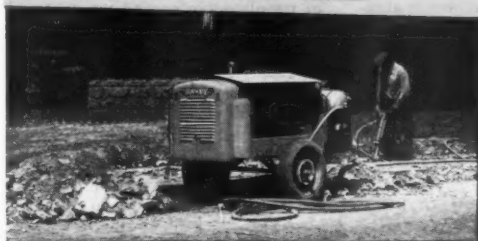
MONARCH ROAD MACH. CO.
323 N. Front Ave., Grand Rapids 4, Michigan



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2



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1 Davey Model 105 on Pittsburgh housing project.

2 Cratty Construction Co., uses Davey 105 on Turtle Creek, Pa. sewer job.

3 Another Davey 105 used by Cratty Construction Co. on Penn Township job.

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air-cooled air

DAVEY COMPRESSOR CO. • KENT, OHIO

Dam Builder Fights Serious Time Limit

(Continued from preceding page)

a shift every piece of equipment was serviced by a mobile service unit, consisting of a Graco Convoy Luber, air compressor, and fuel tanks.

Untold miles were racked up each day by the crawlers on the TD-24's, and under such brutal service a dirt stiff could normally expect roller life to be short. But the Atkinson outfit extended roller life on the TD-24's by at least 300 per cent simply by installing a heavy grease fitting in the place normally occupied by a grease cap. Grease men were careful to inject enough lubricant to get back to the rear part of the roller bearing, where the first signs of failure usually occur. In spite of the many miles of travel these machines performed, roller and track life was excellent.

Special attention was also given to rubber tires. Most of the rock bruises

were eliminated by motor-grader attention to haul roads, but if a stone bruise did develop, the tire was quickly removed and repaired before it was damaged further. There were spare tires of all sizes on hand for use in any emergency. The stock of spare parts was good, and the job only 50 miles from the South San Francisco headquarters of the company, where quite an extensive parts inventory is in stock at all times.

No master mechanic or dirt foreman in the Guy F. Atkinson organization will tolerate for an instant careless or "cowboy" operation of equipment. Recording tachometers were even installed on some of the units, particularly on large Euclids, to make certain the engines were not damaged through excessive rpm's. Undoubtedly the tough but impersonal insistence on competent operation of equipment did much toward making better operators.

Quantities and Personnel

Principal quantities in the project were:

Foundation excavation	430,000 cu. yds.
Spillway excavation	500,000 cu. yds.
Embankment material	1,800,000 cu. yds.
Concrete for narrow spillway back of left abutment	2,500 cu. yds.

The Santa Clara Water Conservation District key engineers connected with the project included Chief Engineer Walter Hunt; Assistant Chief Engineer and Resident Engineer Robert Roll; and Assistant Resident Engineer Patrick Creegan. Atkinson's men have already been mentioned.

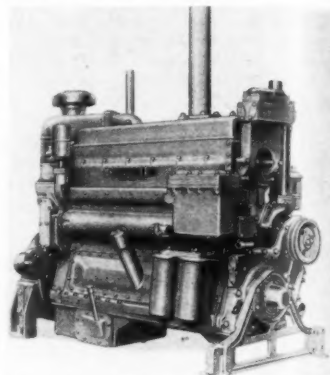
By maintaining the 500,000-yard schedule through September, October, and November, the embankment was expected to be finished in December. It was one of the most critical construction schedules for 1952 on the west coast because the time pressure multiplied as the dam got higher. The elevation differential between the spillway and the dam rest is so small that a bad flood of spillway proportions about the time the dam was three-quarters finished could have been disastrous. The Atkinson outfit is used to this kind of pressure, and knows how to calculate

equipment performance right down to the last cubic yard, but until the finish, the situation continued to be exactly like a baseball game between the Brooklyn Dodgers and the New York Yankees.

The winner couldn't be announced until the last out.

High-Speed Engine

A new high-speed diesel engine has been developed by the Caterpillar Tractor Co., Peoria 8, Ill. The Cat D326 is offered in industrial, electric-set, and marine arrangements.



The D326 industrial engine has an intermittent-output rating of 170 hp at 2,000 rpm and weighs approximately 3,650 pounds. The electric set has a 12-hour rated output of 80 kw and is available as a 50-cycle unit. The marine engine produces 118 hp at 1,600 rpm on 24-hour continuous duty. The basic D326 engine is 6-cylinder and has a 5½-inch bore and 6-inch stroke.

Caterpillar also announces new developments in its fuel-injection system of individual pumps and valves. The pumps are mounted directly adjacent to the cylinders they serve, and the fuel lines made short and identical. These pumps, as well as the intake and exhaust valves, are actuated by a single camshaft.

The engine includes special heat-resisting metal inserts in the tops of pistons and the valve seats. Main and connecting-rod bearings of steel-backed aluminum are said to have high fatigue resistance. Piston cooling is by oil jets from under-mounted nozzles.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 250.

Tough Tarpaulins

A new tarpaulin has been introduced by Canton Containers, Inc., 1101 Ninth St., S. E. Canton 2, Ohio. The C-Line tarps are made of 100 per cent pure Visqueen film.

The company claims that the tarpaulin is light in weight; completely waterproof and mildewproof; weather resistant (it does not become brittle in minus 92-degree weather); transparent, yet tough and tear-resistant; easily washed and dried; and it does not absorb paint or liquids.

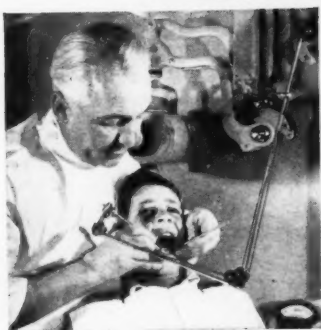
Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 192.

Bulletin on Compressors

A 4-page bulletin on its heavy-duty Oilfreair and Oilfregas compressors has been prepared by Pennsylvania Pump & Compressor Co., Easton, Pa. It points out that the units compress air or gas entirely free of oil or oily vapor. They also feature a steel-backed carbon cylinder-liner and metallic piston rings in the air cylinder.

The bulletin contains a sectional view of the 9-inch stroke Oilfreair compressor and gives complete design data.

This literature may be obtained from the company by requesting Bulletin 600, or by using the Request Card at page 18. Circle No. 244.



IT PAYS TO PROTECT INDUSTRIAL "MOLARS", TOO!

AIRCO HARDFACING PROGRAM — with periodic equipment "check-ups" — can materially reduce overhead on virtually every construction operation! Take manganese bucket teeth, for example . . . you can extend the life of these normally expendable items by as much as six months — with a single alloy application!

AIRCO HARDFACING saves dollars wherever equipment is subject to abrasion . . . impact . . . heat . . . and corrosion. Airco alloys (more than 20 in all) may be applied by electric arc or oxyacetylene flame — right on your premises. Special problems? There's an alloy for every type of equipment and every wear problem!

AIRCO HARDFACING extends the life of irreplaceable equipment, tools and parts . . . prevents breakdowns that slow down your overall operation. With shortages looming . . . it's good sense to "face" it — and make it last! For a complete survey of your equipment and alloy recommendations, contact your nearest Airco office!



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Bigger Power Plant On Road Pulverizer

More horsepower for its scarifying and pulverizing unit is announced by Wood Mfg. Co., P. O. Box 620, 6900 Tujunga Ave., North Hollywood, Calif. An International Harvester UD24 180-hp diesel now replaces the previous power plant on the P-600 Preparer. This represents an increase of 55 hp over the former engine. In addition, drive-on paddles replace the old time-consuming method of bolting paddles to the rotor shaft. These new-type paddles are easily and quickly driven on or off with a sledge, saving on down time for paddle replacement.

The Wood Model P-600 Preparer in one operation scarifies and pulverizes old asphalt mats for 100 per cent re-use. It handles mats up to 6 inches deep in panels 6 feet wide, and has a maximum capacity of 1,500 square yards per hour. Aggregate is returned to its original size in one to three passes. The P-600 will reprocess any asphalt mate-



The Model P-600 Preparer is a one-operation scarifier and pulverizer.

rial that can be scarified by a motor grader.

Wood also offers an attachment for the P-600 which converts it into a soil blender. This machine will blend different types of soil with water into a homogeneous mass to depths reaching 24 inches loose or 12 inches compacted.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 176.

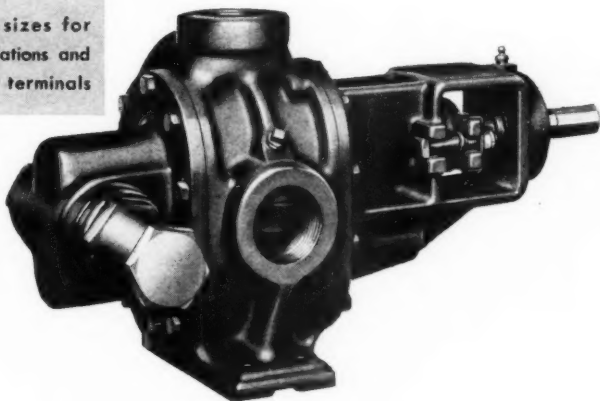
C. I. T.'s Oregon Office

C. I. T. Corp., New York, N. Y., affiliated with Commercial Investment Trust, Inc., and a leading industrial finance organization, has opened new regional headquarters in Portland, Ore. Carl H. Anderson, named Assistant Vice President, is in charge of the new office, which is located in the Equitable Bldg., 421 S. W. 6th Ave. Through this new office the organization will continue to provide service to many construction firms in the northwest.

PUMP IT with a ROPER

series 3600 for tank trucks

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DEPENDABLE SERVICE . . . SPEEDY AND QUIET

Compact 3600 truck pumps are easily installed on side frame or cradle. They can be direct or chain-driven from power take-off . . . supplied for mounting on left or right side of truck. Sizes range from 40 to 300 G.P.M.; pressures to 60 P.S.I. Consider Roper for new equipment or replacement so you can deliver the goods even better!

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2. **Adjustable Relief Valve** . . . permits closing discharge without stopping pump. Adjustable from range of 20 to 60 pounds per square inch.
3. **Hardened Gears** . . . helical type gears designed to run in axial hydraulic balance. Mesh perfectly, friction reduced, vibration eliminated.
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5. **Hardened Steel Shaft** . . . full diameter heat treated and hardened. Built to withstand rugged service.
6. **Outboard Bearing** . . . built right on the pump protects the pumping gears and inner bearings. No extras to buy.
7. **Packing Box** . . . deep and contains 8 preformed split-ring packings. Reduces wear and assures leak-proof service.

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- 30 illustrations of sling uses.
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"Service increased about 2 or 3 times," reported by user of Tuffy Slings. Put Tuffy to the test! See how only Tuffy, with the 9 part, machine-braided wire fabric construction gives greater flexibility, strength and efficiency than conventional type slings.

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Firm Name _____
By _____ Title _____
Address _____ City _____ State _____

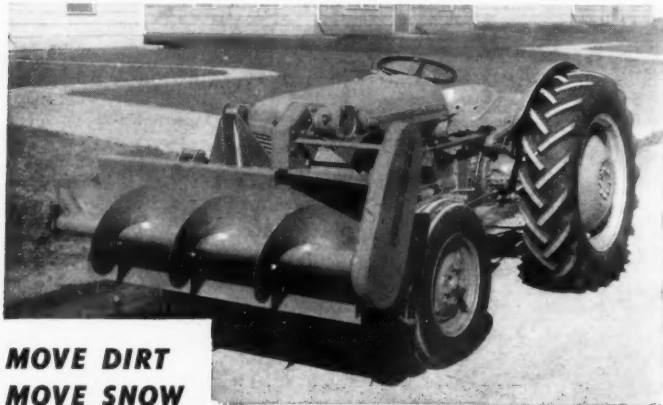
Converts Dry Masonry Saws to Wet Cutting

A kit for converting dry masonry saws to wet cutting is offered by Robert G. Evans Co., 6315 Brookside Plaza, Kansas City, Mo. The Target conversion kit consists of a steel reservoir for the water; an electric pump for recirculating the water; machine tubing and

spray nozzles; and a canvas back-drop.

The company claims that the unit can be installed in any dry saw in 5 minutes. They also point out that wet cutting eliminates dust and extends blade life.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 138.



**MOVE DIRT
MOVE SNOW**

SHAWNEE CYCLONE AUGER ATTACHMENT FOR SHAWNEE DOZER



The SHAWNEE CYCLONE AUGER does angle dozer work without side draft. Ideal for terracing — yard grading — back filling — snow removal. Attaches to Ferguson or Ford tractors in less than 30 minutes.

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THE JAEGER MACHINE CO.
Columbus, Ohio

KOEHRING COMPANY
Milwaukee, Wis.

KWIK-MIX COMPANY
Port Washington, Wis.

THE T. L. SMITH COMPANY
Milwaukee, Wis.

WORTHINGTON CORPORATION
Construction Equip. Div., Plainfield, N. J.

AGC Receives Safety Award

At the 40th National Safety Congress in October, the National Safety Council presented its new award "for exceptional service to safety" to The Associated General Contractors of America. The honor, which is issued annually, gives recognition to associations for the general excellence of their safety programs and for their contribution to the reduction of occupational injuries in their industries.

In appraising AGC activities to promote safety in the construction industry, the Council's technical committee and committee of judges made a comparison of the years 1941 and 1951. In that period the number of member firms (over 6,100) who submitted reports on construction accidents—an important step in the over-all effort to reduce accidents—increased 655 per cent. The average number of lost-time accidents per million hours worked in 1951 was 75 percent of the 1941 rate; the average number of days lost due to

accidents for each 1,000 hours worked was 65 per cent of the 1941 rate. The AGC was also commended for the publication of its revised "Manual of Accident Prevention in Construction," which was issued in pocket-size reprints, and for its nationally integrated safety organization.

The Portland Cement Association, along with four other member trade associations of the Council received an identical award at a special session for small business and association executives.

New Division for Cook Bros.

Cook Brothers Equipment Co., Los Angeles, Calif., manufacturer of heavy-duty trucks and truck equipment, has formed a new division to handle its Series MC trucks, which are designed and engineered as crane and shovel carriers. Robert H. Fox is Sales Director of the division, which will be known as the Crane and Shovel Equipment Division.



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WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

Engineering Building Labs Opened by I-H

International Harvester Co., Chicago, Ill., has opened its new \$8,000,000 engineering building and laboratories in Fort Wayne, Ind. Built for the company's Motor Truck Division, the new operation employs about 633 people—engineers, technical, professional, office, and clerical people. For the first time in the company's history, the Harvester motor-truck engineering and advanced engineering groups are under one roof and working in an environment most conducive to the design, test, and development of motor-truck transportation.

The E-shaped 3-wing building has only one story, and is devoted to design in the north wing, shop and road test in the center wing, and engineering and test laboratories in the south wing. A feature of the engine lab is a cold room where trucks can be exposed to temperatures as low as 70 degrees F below zero. The axle and transmission lab also contains a room unique in the motor-truck industry. It will house a 100-hp electric chassis dynamometer which will take on a whole truck including its cargo weight or equivalent. Aside from the laboratories and offices, the building includes a completely equipped medical dispensary and a modern air-conditioned cafeteria.

W. D. Reese, Manager of Engineering for the Division, and P. T. Brantingham, Assistant Manager of Engineering, are the administrative heads of the new operation.

At the formal dedication ceremonies last September, John L. McCaffrey, President of International-Harvester, was the principal speaker at a luncheon for approximately 300 Fort Wayne civic and business leaders, representatives of engineering schools, and the press. After the luncheon the guests toured the new facilities.

Eleventh Short Course On Roadside Development

The report on the proceedings of the Eleventh Short Course on Roadside Development conducted last October in Columbus, Ohio, has been published by the Department of Landscape Architecture of Ohio State University and the Ohio Department of Highways. It includes papers presented at the meetings, together with questions and com-



International Harvester's new building and laboratories at Fort Wayne, Ind.

ments made from the floor.

Subjects covered are representative of some of the current problems and possibilities for their solutions in the development and maintenance of the

"complete highway". They include: Stabilized Turf Shoulders; Erosion Control in Engineering Works; Mechanized Equipment and Methods of Roadside Development and Maintenance;

Highway Trees; Protection with Pentachlorophenol; and Roadside Management. Copies of this report may be obtained by writing to Prof. Charles R. Sutton, School of Architecture and Landscape Architecture, Ohio State University, Columbus 10, Ohio, or to Wilbur J. Garmhausen, Chief Landscape Architect, Ohio Department of Highways, Columbus 15, Ohio.

The book includes a report on the construction of the "complete highway" model shown at the Short Course, and an account of the States' Activities Dinner—a popular innovation for this year's conference. At this informal meeting representatives of each of the attending agencies and organizations were asked to comment briefly on their activities. Their remarks are contained in the book in the belief that they supply a good record of the current work under way in the various sections of the United States and Canada.

Plan your New Year Resolutions now!

Multiply Your Bridge Bid Chances By

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With Armco MULTI-PLATE Structures you have three good chances to be awarded small bridge jobs.

Whether the proposed bridge is for a new installation, replacing a worn-out bridge, or relining existing structures, you can figure the job with Armco MULTI-PLATE Pipe, Arch and Pipe-Arch. One of these will prove best for the particular bridge problem—in cost and application.

All three have cost-saving features in common. Each is assembled from pre-curved, corrugated metal sections that are bolted together on the site to form sturdy pipe, arch or pipe-arch. Handling is easy and the job is done quickly with a small unskilled crew. Installation costs are kept low. These advantages encourage job-getting bids that include a good profit for you.

For smaller drainage installations figure on using Plain Galvanized Armco Corrugated Metal Pipe, PAVED-INVERT Pipe, ASBESTOS-BONDED Pipe, or Pipe-Arch. All offer installation economies. Write for details. Armco Drainage & Metal Products, Inc., 4742 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.



NEW BRIDGE installations may require the use of Armco MULTI-PLATE Pipe-Arch, because of limited headroom.



REPLACING worn-out bridges with Armco MULTI-PLATE Pipe frequently can be done without detouring traffic.



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Only Jackmanco contractor's barrows have these outstanding features! A low lift from grade, carrying more of the load over the wheel. Trays that are press-formed and have double folded corner construction, making them absolutely non-leakable . . . easy-pouring . . . extra-strong.

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Oldest and largest wheelbarrow maker in America

ARMCO DRAINAGE STRUCTURES



State Ready for Snow

Without accurate knowledge of what Jack Frost's activities will be this winter, Connecticut is prepared. Some 560,000 feet of snow fence is installed throughout the state in locations where the highways are subjected to drifts. Sand is stockpiled at strategic sites, and salt bins are filled. If necessary more than 500 pieces of snow-fighting machinery can be marshaled, and there are 1,500 men waiting to use it.

Snow and ice-control equipment has come a long way in Connecticut since the surplus World War I trucks of 30 years ago. Those early vehicles were an operator's night-mare—no cab, no windshield, and their tires were solid. Today the State's equipment includes: 274 rear-wheel-drive 6½-ton trucks and 53 of the four-wheel-drive type; 111 trucks of 3½-ton capacity; 16 trucks with sand spreaders; two Snogos; two snow plows for most of the trucks and a third "V" plow for the four-wheel-drive trucks; sand and salt spreaders

to be attached to the trucks if needed; and belt loaders and self-propelled bucket loaders.

An integrated schedule of operations divides Connecticut into well defined districts, each one supplied with supervisors, foremen, and maintainers, together with the necessary snow-removal equipment. Maps and charts, showing the allocation of men and equipment throughout the districts, are kept in the Hartford office. To supplement this information, there are lists of personnel assignments, equipment assignments, and each man's telephone number.

With the cooperation of the U. S. Weather Bureau stations at Hartford and New Haven and the State Police Department, all maintenance districts are alerted long before the snow begins to fall. In addition the New Jersey Highway Department warns Connecticut of storms originating to the south and passing over New Jersey, and the time lag before the first cloud reaches Connecticut permits the Highway De-

partment crews to turn out.

It has been the purpose of the Department to keep Connecticut's network of highways open even in the most severe storms. To this end, says G. Albert Hill, State Highway Commissioner, the Department has developed this well organized and highly efficient team which makes Connecticut

safe for winter driving. Not only makes it safe, but the 3,000 miles of state roads are open to travel in 24 hours or less after a storm.

The careful selection and use of good lubricants at regular intervals will keep your equipment operating efficiently and economically.

"ONE MAN and a RYAN does the work of TEN MEN"

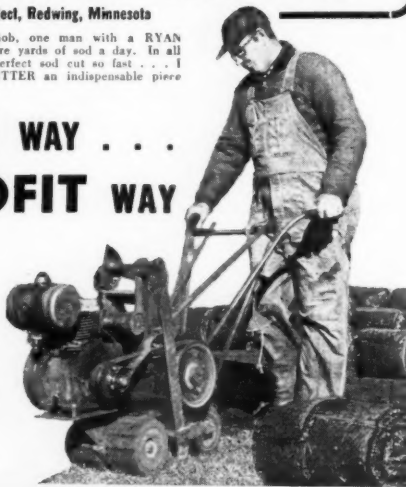
says F. D. Turner, Landscape Architect, Redwing, Minnesota

"On the recent Wayzata Boulevard job, one man with a RYAN POWER SOD CUTTER cut 4,000 square yards of sod a day. In all my experience I've never seen such perfect sod cut so fast. . . . I consider the RYAN POWER SOD CUTTER an indispensable piece of equipment."

**THE RYAN WAY . . .
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- One-man operation . . . Easy as mowing a lawn
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Full power behind both drills with Jaeger air-plus pressure



75 ft. By using a "new standard" Jaeger 365 compressor instead of a 315 on this
125 ft. by-pass bridge approach at Shelton, Connecticut, Mariani Construction Co.
185 ft. was able to hold a 4" wagon drill at top efficiency, averaging 300' per day
250 ft. in shale, and operate a hand-held drill at the same time. All Jaeger sizes
365 ft. offer like advantages—more air per dollar, more production per hour.
600 ft.

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use the WILLARD "TASK FORCE"

YOU BATCH ON THE SPOT with a self-loading Willard Weigh-Batcher! There's no need to haul concrete from a distant batcher plant. . . no need to erect an expensive stationary batcher.

YOU SET UP with no effort beyond digging a shallow pit for the foot of the conveyor. The Willard mobile Weigh-Batcher is self-loading to a predetermined weight. And its capacity is ample to keep two or more truck mixers busy.

YOU SAVE, too, with a Willard Truck Mixer. There is no auxiliary engine. The drum is geared to the truck motor. This allows two feet shorter wheel base—for short turns and more round trips. The rear axle loading with 3 yards of concrete meets the laws of all states.

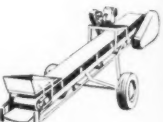
THE "WILLARD WAY" is the time-saving way! You get more done with fewer men and machines. Write for the "Willard Way" booklet.

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WILLARD Weigh-Batcher Loader



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WILLARD Truck Mixer

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and Pile Extractors

Manufacturers of Pile Driving Hammers and Pile Extractors
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Convention Calendar

January 7-9, 1953—Weed Control Conference
Northeastern Weed Control Conference, Hotel New Yorker, New York, N. Y. Dr. Walter C. Jacobs, Secretary-Treasurer, Vegetable Crops Department, Cornell University, Ithaca, N. Y.

January 13-15—National Constructors Meeting
Annual Meeting, National Constructors Association, Hotel Commodore, New York, N. Y. J. O'Donnell, President, 50 E. 41st St., New York, N. Y.

January 13-16—Highway Research Board
Annual Meeting, Highway Research Board, National Academy of Sciences, Washington, D. C. Fred Burggraf, Director, 2101 Constitution Ave., Washington 25, D. C.

January 14-16—Photogrammetry Convention
Annual Convention, American Society of Photogrammetry, Shoreham Hotel, Washington, D. C. Louis J. Reed, Meetings Chairman, 201 Wellington Road, Alexandria, Va.

January 26-27—Landscape Architects
Fifty-fourth Annual Meeting, American Society of Landscape Architects, Atlanta Biltmore Hotel, Atlanta, Ga. Bradford Williams, Corresponding Secretary, 9 Park St., Boston 8, Mass.

January 26-28—Asphalt Technologists
Annual Convention, Association of Asphalt Paving Technologists, Rice Hotel, Houston, Texas. Ward K. Parr, Secretary-Treasurer, Box 376, Ann Arbor, Mich.

January 26-28—Georgia Highway Conference
Georgia Highway Conference, Georgia Institute of Technology, Atlanta, Ga. C. H. Taylor, Coordinator, Georgia Institute of Technology, Atlanta, Ga.

January 26-29—Heating and Ventilating
Fifty-ninth Annual Meeting, American Society of Heating and Ventilating Engineers, Conrad Hilton Hotel, Chicago, Ill. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York, N. Y.

February 1-5—AED Convention
Thirty-fourth Annual Convention, Associated Equipment Distributors, Conrad Hilton Hotel, Chicago, Ill. P. D. Hermann, Executive Secretary, 30 E. Cedar St., Chicago 11, Ill.

February 2-4—Concrete Short Course
Quality Concrete Short Course, Georgia Institute of Technology, Atlanta, Ga. C. H. Taylor, Coordinator, Georgia Institute of Technology, Atlanta, Ga.

February 9-11—ARBA Meeting
Annual Convention, American Road Builders' Association, Statler Hotel, Boston, Mass. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

February 17-19—Concrete Convention
Annual Convention, American Concrete Institute, Statler Hotel, Boston, Mass. William A. Maples, Acting Secretary-Treasurer, 18263 W. McNichols Road, Detroit 19, Mich.

February 23-26—National Sand & Gravel and National Ready Mixed Concrete Associations
Annual Conventions, National Sand and Gravel and National Ready Mixed Concrete Associations, Fairmont Hotel, San Francisco, Calif. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

February 24-26—Illinois Highway Engineers
Thirty-ninth Illinois Annual Conference on Highway Engineering, University of Illinois, Urbana, Ill. Wm. S. Pollard, Jr., Department of Civil Engineering, University of Illinois, Urbana, Ill.

February 26-28—Concrete-Pipe Meeting
Forty-fifth Annual Convention, American Concrete Pipe Association, Baker Hotel, Dallas, Texas. Howard F. Peckworth, Managing Director, 228 N. LaSalle St., Chicago, Ill.

March 2-8—ASCE Meeting
Spring Meeting, American Society of Civil Engineers, Fairmont Hotel, San Francisco, Calif. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York, N. Y.

March 2-8—ASTM Meeting
Spring Meeting and Committee Week, American Society for Testing Materials, Hotel Statler, Detroit, Mich. Robert J. Painter, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 18-22—NACE Conference
Ninth Annual Conference, National Association of Corrosion Engineers, Hotel Sherman, Chicago, Ill. A. B. Campbell, Executive Secretary, 1061 M & M Bldg., Houston 2, Texas.

March 18-20—New York Highway Engineers
Annual Convention, New York State Association of Highway Engineers, Hotel Statler, Buffalo, N. Y. William Gallancy, Convention Chairman, State Department of Public Works, 65 Court St., Buffalo 2, N. Y.

March 23-27—AGC Convention
Thirty-fourth Annual Convention, Associated General Contractors, Miami Auditorium, Miami, Fla. Charlson I. Mehl, Administrative Aide, Munsey Bldg., Washington 4, D. C.

ami, Fla. Charlson I. Mehl, Administrative Aide, Munsey Bldg., Washington 4, D. C.

March 24-27—Greater New York Safety Council
Twenty-third Annual Safety Convention and Exposition, Greater New York Safety Council, Hotels Statler and New Yorker, New York, N. Y. Paul F. Stricker, Executive Vice President, 60 E. 42nd St., New York 17 N. Y.

April 6-9—Purdue Road School
Purdue Road School, Memorial Union Bldg., Purdue University, W. Lafayette, Ind. Prof. Ben H. Petty, Civil Engineering Bldg., Purdue University, Lafayette, Ind.

April 10-11—Michigan Engineering Meeting
Annual Meeting, Michigan Engineering Society, Kellogg Center Hotel, Michigan State College, East Lansing, Mich. Joseph E. Wilbur, Executive Secretary, P. O. Box 573, Kalamazoo, Mich.

April 13-15—Lubrication Engineers
Annual Meeting and Lubrication Exhibit, American Society of Lubrication Engineers, Hotel Statler, Boston, Mass. William P. Youngclaus, Jr., Administrative Secretary, 343 S. Dearborn, Chicago 4, Ill.

April 13-15—South Dakota Short Course
South Dakota Highway Short Course, Student Union Bldg., Brookings, S. Dak. Prof. Emory E. Johnson, Civil Engineering Department, State College Station, S. Dak.

State College Station, S. Dak.

April 28-30—Wood Preservers' Convention
Annual Convention, American Wood Preservers' Association, Cleveland Hotel, Cleveland, Ohio. Harry J. Schulte, Hotel Committee Chairman, 20106 Kinsman Road, Cleveland 22, Ohio.

Brunner & Lay, Rock Bit

Joe Klemeyer, former Sales Manager of Brunner & Lay, Inc., Franklin Park, Ill., has been named General Manager

of its subsidiary, Rock Bit Sales & Service Co., Philadelphia, Pa. He will direct manufacture and sales of pneumatic-tool accessories, drill steels, and carbide drilling products. Wayne Burnside was at the same time appointed Sales Manager of Rock Bit.

E. A. Bowman, former Sales Representative for the central states at Brunner & Lay, succeeds Mr. Klemeyer as Sales Manager of the parent company.

Use Swenson self-feeding material spreaders for fast, easy application of salt, chloride, sand, cinders, gravel or a combination of these materials

Free Information

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Lindenwood, Illinois



STEERING IS EASY - WITH GALION'S HYDRAULIC BOOSTER

The going may be extra-rough - and the operator may have only **ONE** arm - but no more effort than the fingertip pressure of one hand is needed to operate the steering control on a GALION Grader!

EASY STEERING MEANS BETTER WORK

With the hydraulic booster doing the "muscle" part of steering, the operator of a GALION Grader can concentrate all attention on doing a better job of blading.

LARGE FRONT TIRES

The large front tires (same size as used on rear wheels) help prevent side drift of the front end, and give higher front axle clearance.

Hydraulic booster and large front tires are **STANDARD EQUIPMENT** on Galion Grader Models 118, 104 and 203 (and available as "extras" on Model 303).

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How Design Affects Construction Costs

Engineer - Contractor Cooperation Over Designs Keeps Costs Down, M-C&S President Tells ASCE

• THE cost of construction is to a very large extent dependent on engineer design, and this question formed the theme of a recent address given by Ralph E. DeSimone, President of Merritt-Chapman & Scott Corp., New York, N. Y. The occasion was a symposium held at the American Society of Civil Engineers Centennial Meeting in Chicago, last September, and Mr. DeSimone was one of four speakers participating in the joint session of the Construction and Structural Divisions. He and Gen. W. W. Wanamaker, Chief Engineer of the Orinoco Mining Co., spoke as contractor representatives. Glenn B. Woodruff, San Francisco consulting engineer, and Leslie N. McClellan, Chief Engineer, U. S. Bureau of Reclamation, were the engineer representatives.

Mr. DeSimone, taking as his premise that it is to the interest of everyone—the engineer, the contractor, and the owner—to keep costs down, divided the problem into two phases. First: costs that are written into the plans and specifications before being handed to the contractor. Second: variables in cost which result after performance begins.

Design: Friendly Criticism

Unless otherwise stipulated, said Mr. DeSimone, the contractor must take it for granted that the engineer's plans, as handed to him, are complete, definitive, and descriptive enough to show precisely what the owner has in mind. The engineer, too, usually prepares an estimate of cost for the use of his client as a comparison against the bids received. Mr. DeSimone warmly recommended a procedure that is sometimes adopted, whereby contractors are invited to review the design for friendly criticism, before bids are invited. He cited several examples where such a policy paid off—and others where failure to do so, or failure to heed the contractor's advice, had resulted in greatly increased costs. From the point of view both of the designing engineer and of the contractor, this opportunity for friendly consultation and mutual advice is of the utmost importance.

When it comes to bidding, the contractor, in order to determine his bid price, studies the plans and specifications, analyzes the design, checks quantities, and in cases where there may be obvious doubt about the intention of the design, may seek conferences with the engineer for clarification. Then, on the basis of his experience and judgment with regard to the particular type of project, the contractor arrives at an estimate of cost, adds his profit margin (and contingency, if any), and submits the resultant figure as his bid.

Translation Into Construction

The critical stage, when the cost of construction may be increased or decreased, has now been reached. Designs are usually of a high degree of excellence. In many instances, however, they do not show all of the details and are not flexible enough to be easily adapted to changed conditions in the field should such conditions be encountered. Too often, the application of the plans to the site conditions is left to the interpretation of field representatives who have not had enough practical experience in working out problems with contractors, and are consequently unable to provide an alternate construction which will meet all the requirements.

This matter of interpretation, in Mr. DeSimone's opinion, is the principal factor in creating controversies, delays, and increased cost. It is of the utmost importance that the engineer should assign to the project site field representatives who are qualified in every respect—which means that they should have both the ability and the authority to make binding on-the-spot decisions when the occasion demands it. But there is no need for a field representative to "police" the contractor. The latter is just as anxious as the former to follow specifications as far as field conditions permit.

Mr. DeSimone gave several examples of specifications which could not, when it came to the point, be carried out as designed. One instance was in connection with steel H-piles—one of the

toughest items of cost in any construction contract. On this particular job the entire project margin disappeared because it proved impossible to drive piles of the lengths specified, and the specifications were so written that the contractor could not be reimbursed for cutoffs, most of which ran into substantial lengths. Another case involved pipe laying. The specifications for a heavy concrete sewer-outfall pipe required the pipe to be laid on blocking resting on soft bottom. After making several unsuccessful attempts to lay the pipe in this way, the contractor protested that it was not feasible and asked permission to lay the pipe on a pile foundation, with pavement for the additional cost. His request was refused. He gave up

the job, after sustaining a terrific loss, and was driven into bankruptcy. The end of that particular story was that the contract was given to M-C&S with instructions to lay the pipe on a pile foundation.

All this adds up, said Mr. DeSimone, to the importance of engineers and contractors sitting down together and endeavoring, with mutual respect, to solve their problems in an honest and practical way. To preserve the balance of the examples cited, Mr. DeSimone mentioned the case of a large bridge contract where the contractor suggested an alternate design, the engineers accepted it, and the final result was that costs were kept within the amounts set in the contract. Time, too, was saved—an important point.

Turns with POWER ON BOTH TRACKS

SWINGS FULL LOAD WITH THE GREATEST OF EASE—a tight turn with a lift gives the TD-24 a chance to show off its power.



Coordination of Skills

One of the greatest difficulties a contractor experiences from time to time is the lack of coordination of the design as a whole, especially on certain types of building construction. Some of these projects are highly specialized, involving a number of diverse skills—architectural, structural, mechanical, electrical, and others. Yet it often appears to the contractor that there has been little attempt to coordinate the various designs involved in the over-all structure. One unfortunate contractor was faced with staggering ambiguity and discrepancies in the various designs. He received not only hundreds of revisions in the drawings, but nearly 1,000 letters of clarification that involved several thousand items and re-

sulted in hundreds of change orders. Result—progress was slowed to a snail's pace.

Recommendations

Summing up his remarks, Mr. DeSimone offered the following recommendations for keeping down construction costs:

1. In preparing his design, the engineer should keep constantly in mind the methods the contractor will have to use for economical construction.

2. The engineer should be responsible for the accuracy of borings and other subsurface data shown on the plans.

3. Engineering plans, while complete and definitive, should still be kept flexible enough to be adapted without loss of time, and if possible without in-

creases in costs, when changed conditions are encountered in the field.

4. The interpretation of plans and specifications in the field ought to be entrusted by the engineer to supervisory personnel who have had practical experience with contractors, who understand the contractors' methods of obtaining results, and who have binding authority to make decisions.

5. Engineer and contractor representatives should hold regularly scheduled field meetings to discuss various phases of the work and offer mutual assistance.

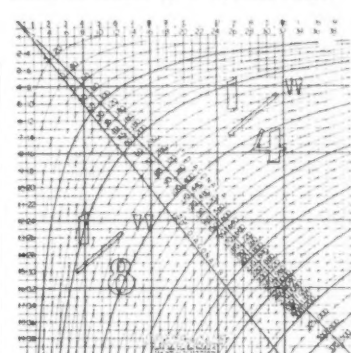
6. Any separate specialty designs ought to be thoroughly coordinated in advance, with field conditions in mind.

7. It should always be remembered that a design which appears most economical from a purely design stand-

point may actually be most costly if it entails the development of special construction methods.

Device Measures Area Directly From Plans

A new device for making quick area and volume measurements on plans and drawings is announced by New-Era Products, 6 Peter Cooper Road, New York 10, N. Y. The 5 x 5-inch Space-Scale is a transparent vinylite template operated by simply placing it over the space to be measured. The grid and curves are printed in red and black for either $\frac{1}{8}$ or $\frac{1}{4}$ -inch scale.



Rectangular areas are obtained by placing the template on the drawing with its upper left-hand corner on the upper left-hand corner of the space. The curve cutting the lower right-hand corner of the space indicates the area.

For circles, the template is placed on the drawing with the top of the circle at the top of the template. The curve cutting the intersection of Diagonal B and the bottom of the circle gives the area.

The Space-Scale can also be used as a slide rule, and will measure cylinders and cubes.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 168.

Concrete-Forming System Described in New Catalog

A 43-page catalog on concrete-forming equipment is available from Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill. It gives complete information on and illustrates the company's line of standard panels, runways, circular wall forms, shores, and column clamps.

The Symons system uses panels with tie rods anchored from the sides instead of passing through. The company points out that side ties eliminate fishing for openings. Also, when stripping forms, the panels may be lifted straight up instead of first being pushed away. The tie rod has looped ends through which the connecting bolt is passed, eliminating the necessity of making holes in the panel.

The Symons shore is made of two 2 x 4's tied together and reinforced their full length. A safety wedge prevents slipping. A one-man jack used with the shore can lift 1,500 pounds.

This literature may be obtained from the company by requesting Catalog No. F-8, or by using the Request Card that is bound in page 18. Circle No. 131.

Fabel Is Thermoid President

George S. Fabel, former Vice President of Thermoid Co., Trenton, N. J., has been elected President of the company in succession to Fred E. Schluter, who has resigned this post. Thermoid manufactures automotive and industrial rubber, asbestos, and textile products in New Jersey, North Carolina, Indiana, Utah, and California. Mr. Fabel has been with the company for over 30 years.

International Steering system helps "Big Red"—the TD-24—do more work in less time

What's the pay-off for a crawler tractor?

The most work done per day.

What delivers the pay-off?

Superior speed and power—and fingertip steering to take advantage of that speed and power. Like this:

The operator of your Big Red TD-24 drops one track into low speed, and the huge crawler comes around, moving right along with its load, turning with power on both tracks!

The TD-24 makes gradual turns with power on both tracks, feathered turns of any degree, or pivot-turns—all with fingertip ease of control. Planet Power Steering lets the operator

turn while pulling heavy loads and also maneuver in close quarters. That's why the TD-24 is the most versatile of all crawlers.

Add this to the TD-24's tremendous power—more drawbar horsepower than any other crawler on the market—and you get what you want: more dirt moved, more work done per day.

Isn't that reason enough to put the TD-24 to work for you? Especially when it's backed by your International Industrial Distributor's complete service facilities. Get the details... you'll be a TD-24 man from then on in!

**INTERNATIONAL HARVESTER COMPANY
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POWER THAT PAYS

TIGHT TURN WITH A BIG SCRAPER. "Big Red"—the International TD-24—pulls a big 25-yard scraper with a full load in close quarters on a road relocation job.





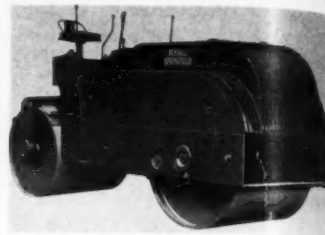
This General Motors generator set and Ingersoll-Rand No. 600 Gyro-Flow compressor are furnishing power for lights, blowers, pumps, and power saws; and air for cement mixers, jackhammers, and a pump on Poudre Canyon Tunnel No. 1, part of the Big Thompson Project, Colo. General Motors Series 71 diesel engines power both pieces. G. I. Tarlton Co. is the contractor.

Tandem-Roller Line Has New Improvements

Production of its new Model C 2-axle tandem-roller line is announced by Buffalo-Springfield Roller Co., 5212 Reservation Road, Springfield, Ohio.

Features include an open grillwork over both sides of the drive roll which allows operators to see the roll edge directly through the top of the machine; increased ground clearance to 17 inches on 5 to 9-ton tandems and 20 inches on 8 to 14-ton tandems; and final-drive gears armored against possible damage by a steel-plate-frame member. Model C has a large hinged top cover that gives complete accessibility to the engine for major overhauls and a 4-speed transmission. This transmission is said to allow a greater range of road speeds at full engine power.

Other improved features cited by the company include extra-large hinged side covers for easy engine access and cooler operation in hot weather; axles



of heavy tie-bar construction; and removable cap on guide-roll yokes for ease of assembly and disassembly. The new corrosion-resistant fuel tank is made of terne plate and is completely separate from the water tank and independently removable from the roller. This eliminates possible leakage between gasoline and water. Dual controls and double-seat posts permit operation from either side of the machine; the radiator is located at the guide-roll end for clean air-intake from the top; optional transmission or roll-mounted brakes are available.

Basic Buffalo-Springfield features retained by the new model are: bevel-gear final drive; low-pressure hydraulic steering system; and drive-opposite-operator.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 149.

Line of Hydraulic Hoists

A new series of 15 technical-data bulletins on its complete line of hydraulic hoists is being issued by The Galion Allsteel Body Co., Galion, Ohio.

Each bulletin includes full specifications for one individual hoist. The data listed include: hoist type, weight, stroke, cylinder diameter, mounting height, dump angle, and piston-rod diameter. Bulletins are illustrated with large closeup hoist photos and application pictures. Hoist pumps are shown in detailed cutaway form.

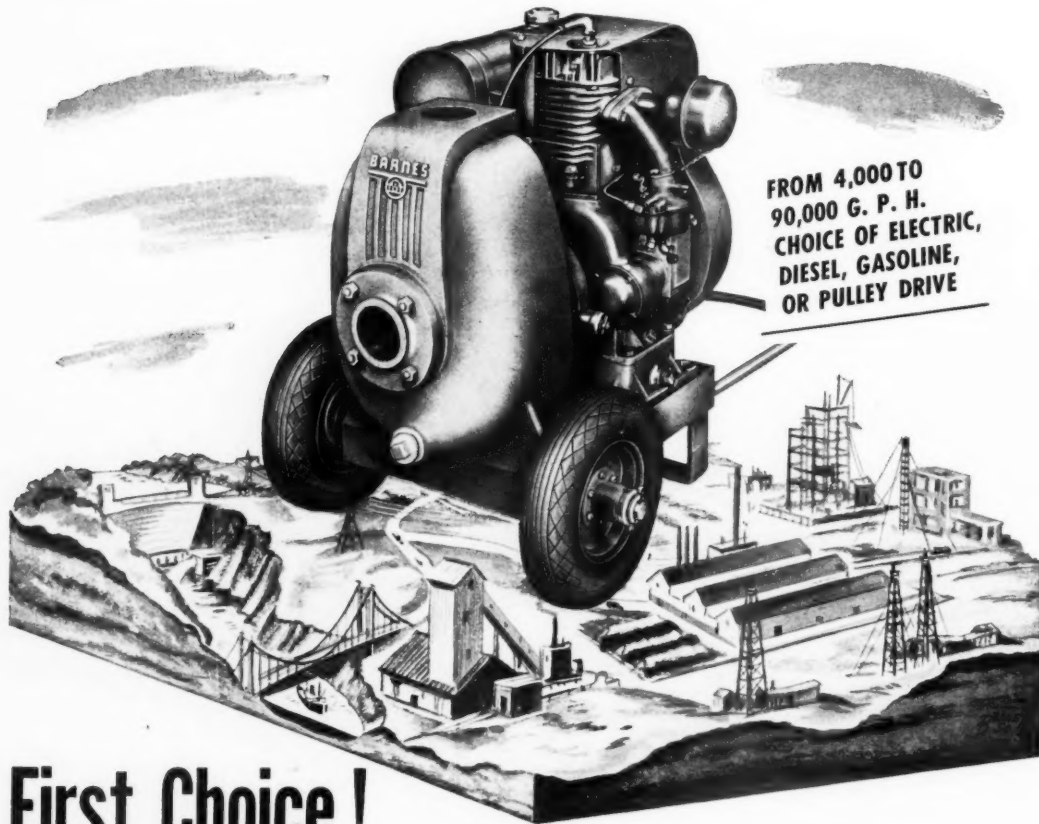
A bulletin feature is a handy hoist-capacity reference table. This permits easy checking of the body length and approximate overhang against the desired hoist capacity.

Bulletins are so designed as to be easily bound into a complete catalog, or can be used separately for ready reference or mailing purposes.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 137.

Grace Heads Polio Drive

As a result of the severe polio epidemic this year (expected to claim over 54,000 victims), the need for funds to continue patient-care and research is especially pressing. Under the program of the National Foundation for Infantile Paralysis, four out of every five polio patients receive direct financial assistance, and this year's epidemic will tax the financial resources of the Foundation to the utmost. The Advance Gifts Committee of the 1953 Greater New York Campaign for the Foundation has set a goal of \$4,000,000 and has placed at the helm of this drive J. Peter Grace, Jr., President of W. R. Grace & Co., international industrial and trading concern. Mr. Grace is also President of Grace Chemical Co.



FROM 4,000 TO
90,000 G. P. H.
CHOICE OF ELECTRIC,
DIESEL, GASOLINE,
OR PULLEY DRIVE

First Choice!

OF MEN WHO KNOW PUMPS AND PUMPING

It's the Barnes "33,000 for 1" Every Time

1ST IN PUMPING ECONOMY -

Barnes Automatic Centrifugals deliver not 1,000—not 10,000—but 33,000 gallons of water for each gallon of gas used. That's equal to 4 1/2 railroad tank cars filled and overflowing. And that's pumping economy unmatched!

1ST IN SURE OPERATION -

Barnes Self-Priming Centrifugals will prime with pump body filled as low as 1/3 normal water level. Exclusive Barnes Peri-Prime feature gives surer, faster priming—with no loss in pump efficiency in recirculation!

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Dual-Use Feature in Single-Level School

Sidney, Iowa, Consolidated School District Adds Combined Auditorium-Gymnasium to Central Building Group

YOUNGSTERS living in this age are fortunate in having schools that cater to their physical training as well as their mental education. Direction and supervision of play, of social activities, and of varied educational programs ranging from mechanics to arts and sciences, have encouraged building designs to fit the job.

Modern designs get the most out of space. As in store or factory, educational footage must pay off. So construction-wise education has gone slightly ranch-type. But single levels are not simple to build and so the auditorium-gymnasium single-level building for the Sidney Consolidated School District, Sidney, Iowa, makes a good example of this trend in the low-cost bracket.

This is a one-floor job with a part basement and contains a dual-purpose auditorium-gymnasium with 10,668 square feet of floor space, a basement farm shop with street-level overhead-door entrance, home-economics room, and showers, lockers, and drying rooms for boys and girls. The building was designed by John Latsenser & Sons, architects and engineers of Omaha, Nebr. Dimmitt Construction Co., Shenandoah, Iowa, was the general contractor for the building construction.

Although the cost of construction was only \$150,000, equipment and furnishings ran the cost above \$200,000. For instance, roll-away bleachers for the auditorium cost between \$8,000 and \$10,000. With this equipment the seating can be folded up against the wall like a roll-away bed and leave the floor clear for sports.

The Building

The building is located on the school grounds in Sidney containing two older buildings—the Sidney High School and the Sidney Grade School. The school grounds take up almost an entire city block.

Construction was started August, 1951, and the job was completed by late summer of this year.

Terrain is sloping and the design takes advantage of it by locating the partial basement on the low side where necessary excavation was negligible. This made it possible to locate the 14-foot overhead door for the farm shop at street level. The shop measures 23 x 84 feet. Outside walls measure 108 x 127 feet. The auditorium-gymnasium section is 84 x 127 feet, which includes a 23 x 84-foot stage and a concrete floored section in the rear for roll-away bleachers. This section measures 20 x 84 feet.

Auditorium-gym floors are wood on wood sills bolted to concrete piers 8 inches wide and 93 feet long, spaced on 10-foot centers in the 86-foot space. Crawl space between piers is floored with 2 inches of unfinished concrete. The stage has tongue-and-groove flooring on concrete and is completely wired for complex stage lighting and sound effects.

Showers and locker rooms for girls are on the main floor and adjacent to the home-economics room and the gym. Showers and lockers for boys are located directly beneath in a section of the basement and are readily available from farm shop or gym. Shower sections are 8 x 10 feet and walls are 5 x 12-inch salt-glazed bearing tile. Each shower and locker section has a drying room and these floors are pitched

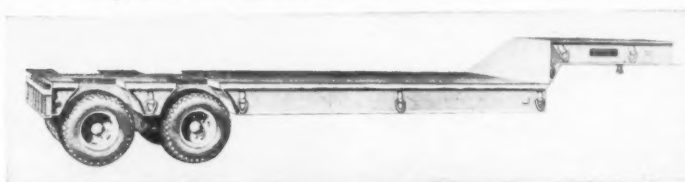
1½ degrees to weep holes in the walls leading to the shower drains.

Main walls are hard-faced buff-colored brick backed up with either concrete blocks or Haydite, both being used as specified in the plans. Main wall thickness was 12 and 17 inches—the thicker width on the higher walls of the auditorium-gym, which reached 30 feet. Brick was laid in regular courses with a bond or header course every sixth course. All brick was laid in a full bed of mortar and head joints flushed full

(Continued on next page)

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Dual-Use Feature in Single-Level School

(Continued from preceding page)

to prevent rain beating through. Bedford stone was used for window sills and these stone sills were kept covered during bricklaying above to prevent mortar stains. Mortar for brick and concrete blocks was mixed in a CMC Wonder mortar and plaster mixer. Stone was set with Atlas White or Medusa cement mortar.

Reinforcing mesh was laid between courses and lapped 8 inches at ends when joints had to be made. Concrete blocks, tiles, bricks, and clay-tile coping were cut when necessary with a Model HD Clipper masonry saw.

Concrete

The concrete work consisted of plain and reinforced-concrete floors, exterior platforms, steps, foundation footings, and pilaster caps. All concrete was handled by the general contractor and



Houck Photo

The east end of Sidney, Iowa, school's auditorium-gym. Pilasters between the clerestory windows enclose columns of steel frame.

was mixed on the job in a CMC 11-cubic-foot mixer.

Concrete flow setup provided for mixer discharge into Bell Prime Movers of 1,500-pound-capacity and powered with Wisconsin engines. These Prime Movers were also used to transport

blocks, bricks, and other material to the workmen.

The mixer was loaded from wheel barrows, which were filled with aggregate from a small job-built wooden hopper elevated above a Fairbanks-Morse indicating scale and located ad-

jacent to the loading scoop of the mixer. The hopper was filled by a Ford tractor equipped with a front-end loader. This tractor shuttled back and forth between the aggregate pile and the hopper a distance of 25 feet and easily kept the hopper filled against the speed of the mixer.

Economy steel forms were used for most of the poured walls. For concrete vibration two Dart vibrators were brought into action.

All subgrades were tamped and leveled at the indicated elevation. Thor tampers were used and air was supplied by a Jaeger 75-cubic-foot air compressor. The contractor also had Thor breakers and hammers on the job, and these were used in preparing the site for footings. Aggregate was obtained locally.

Ash Grove portland cement was used. Concrete mix was 6 sacks to the yard with not more than 6¾ gallons of water to the sack. This gave concrete with a compression strength of over 1,400 psi at 7 days and 2,500 psi at 28 days. As a waterproofing measure for the poured exterior walls, exclusive of footings below grade, the portland cement was mixed with 10 per cent of dehydrated lime.

Concrete Floors on Earth

No earth-based floors were poured until the roof was on and the subgrade dry, tamped, and leveled to elevation. Earth-based floors were then poured in the home-economics room, the bleacher base at rear of gym, the farm shop, and the boiler rooms. The floor under the bleachers is maple.

A subbase of 6 inches of pit-run gravel was placed in these areas and this fill was covered with one layer of prepared 55-pound roll roofing, lapped 4 inches, to provide a membrane vapor barrier.

A ½-inch bituminous expansion joint was provided at all wall and column joints. Floors were reinforced with No. 9 steel mesh with 6-inch openings and lapped 4 inches at joints. Floor mix was one part portland cement to 4 parts washed sand and gravel, conforming to specifications for concrete aggregate. Floors, stairs, and platforms were given a cement topping 1½ inches thick. The mix for this was 1 part portland cement, 1½ parts sand. Concrete to which the topping was applied was left rough and was thoroughly wetted and scrubbed before application.

Concrete was cured with water. The curing was kept on a precise schedule. All exposed concrete was kept moist for 72 hours after pouring and was wetted at least twice daily during the first week. Concrete floors, platforms, and steps were covered with burlap, which was kept wet for a period of 72 hours.

Canopy, exterior stoops, and platforms were formed with plank lined with form-grade plywood. Wall forms were left in place for 3 days, subject to weather conditions; slab bottoms and beam sides, 7 days; and forms on beams and joist bottoms, 14 days. Shores under joists and beams were not moved until supported forms were ready for removal. Reinforcing steel was furnished by the Ceko Steel Products Corp., Omaha, which also furnished the steel sash windows.

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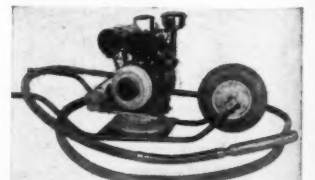
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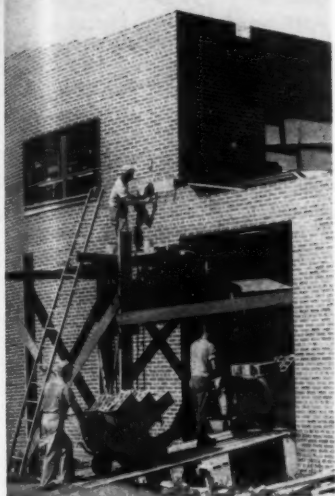
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Two Bell Prime Movers kept bricklayers supplied with blocks and brick.

Rigid Steel Frame

The 30-foot-high auditorium-gymnasium has a rigid steel frame, while roofing below levels of the clerestory has wood joists. The frame is a variation of the "tree" type, which uses no bracing or trussing. It is popular in rambling one-story industrial structures, airplane hangars, and large gymnasiums, because column support is eliminated except in the walls.

The Sidney school's steel framing consists of four shop-fabbed steel frames of 27-inch 114-pound I-beam, made up in half sections totaling 8 pieces. Each half consists of a column, a knee turned on a 7-foot radius, and a beam 49 feet long from knee to center of roof. Two such sections joined at the apex of the roof make one continuous frame from one pier on one side to a similar pier on the other side.

The knee, which is larger than the column or the beam, is stiffened longitudinally on a diagonal radial line at point of tangency.

Bases of columns are bolted to reinforced-concrete piers and columns rise vertically about 30 feet to the center of the knee. The steel was fabricated and erected by the Gate City Steel Works, Omaha, and a Lorain crane with a 70-foot boom was used for setting the members.

Purlins are steel-channel bolted to rigid frames, except where the ends are based in masonry walls.

Projection of the 27-inch steel I-beam columns inside the walls was eliminated by locating the piers so the web and outside flange of the I-beam were outside. Back-up masonry for the brick walls fitted into the web and under the inside flange, and the outside of the column was bricked over in a pilaster to which ornamental cast-concrete caps were fitted.

The gable-end walls of the auditorium are weather-protected with vitreous clay-tile lap-joint coping. Through wall flashing consists of 3-ounce copper-coated Sisalkraft, which projects over the shield and extends up and over the spandrel girders.

Roofing

Dimmitt subbed the roof to the National Roofing Co., Omaha. Steep roofing was built up with 15-pound asphalt-saturated felt. Roof insulation consists of 1 and 2-inch insulating board. Roofs are surfaced with washed $\frac{1}{4}$ to $\frac{5}{8}$ -inch gravel. Roofs that slope less than 2 inches per foot are coal-tar-pitch built-ups.

Heating

The building is heated by a plant located in the basement. Craig & Son, Tabor, Iowa, handled the heating, plumbing, and ventilation under a separate contract. Unit heaters were used throughout with both horizontal and

vertical delivery.

Personnel

Clyde Dimmitt, President and General Manager of the Dimmitt Construction Co., was assisted by his son, W. D. Dimmitt. Construction was let in three separate contracts—one for general construction, one for heating, plumbing, and ventilating, and one for electric wiring. Dimmitt used a crew of 16 men of his own and with his subs had a working force averaging 20 to 25.

Laurence Hatten is President of the Consolidated District's Board of Education; Theron D. Orr is Secretary, and James Pullman, Jr., is Treasurer.

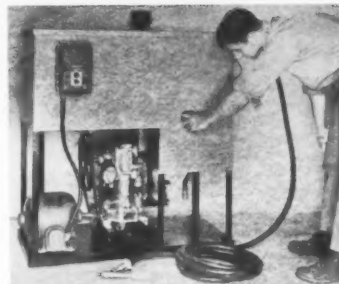
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How One State Tells Its Highway Story

Colorado Sets Up a Public Relations Office to Give Facts; It Pays Off by Reversing Critical Press Trend

By RAY DAY

• SCHEDULED for the national AASHO meeting in Kansas City in December, 1952, is a panel discussion to determine what, if any, should be the qualifications for a public relations man in a state highway department. If Mark Watrous, Chief Highway Engineer for the Colorado Department of Highways, sits in on that meeting, he can give some good advice.

It wasn't very long ago that Watrous dodged automatically every time one of Denver's big daily newspapers hit the street. They gunned for the little guy from the State Highway Department with pictures of washouts, surface failures, and, once in a while just to liven things up, they even threw in a picture of a county road. Today that same newspaper treats Watrous with more kindness. It recently gave an entire magazine spread to the Denver-Boulder Turnpike and the Colorado Highway Department. Watrous' wounds are still there, but at least they're healing now. If asked for his advice, what he would probably say is: "Gentlemen, for God's sake get a newspaper man instead of an engineer."

He should know. For Colorado now has, in the organizational framework of its State Highway Department, a setup for both public and intergovernmental relations. It is headed by a man wise in the ways of public relations, Wallis M. Reef, a writer, former City Editor, Promotion Editor, and Director of a newscast on Denver's radio station KFEL.

Imagine a state highway engineer getting up at a regional meeting of AASHO and delivering a lecture on "The Time and Place for Toll Roads". Watrous did it at WASHO in Seattle, Wash., last June. Imagine a state official going on the air with a slam-bang slashing attack on his needlers. Watrous has done it often and successfully. Imagine, in the light of usual titles for papers at engineering meetings, such titles as "Highway Hysterics" and "Don't Delight the Kremlin". These are some of the examples of the kind of seasoning the engineers in Colorado's Highway Department needed badly. Coupled with factual information which always has been available in the Department's files, such seasoning and Wallis Reef's newspaperman code of ethics have transformed a critical public reaction to one of understanding, tolerance, and even admiration.

Watrous' paper on toll roads was considered by most WASHO delegates—and certainly by this writer—as the most outstanding single presentation of that program. The factual data in that paper consisted of engineering and economics of vital interest to every engineer there, but at the press table sat several newsmen from news services—laymen, mind you—whose attention Watrous commanded. Multiply this example by the number of laymen in the great state of Colorado, and you begin to realize what's happening suddenly.

The strange thing is the fact that Watrous and his Highway Department were just as competent when they were drawing fire as they are now that the fire has stopped. Papers prepared before the formation of a public relations department probably had just as much engineering "meat" in them as they do now. But now they have life: an angle,

which caused Reef to be picked for the job in 1947, when things were blackest.

Honesty and Experience

One day recently, a representative of a small newspaper in which all state-employee news is printed regularly called at Reef's office for details of a particularly good story. It was a story of interest to all state employees. Reef held off the information until he could call all other news services, including the representative of the paper which had formerly been critical of the Highway Department, and give them all the same information. It was such a small but thoughtful touch, but those are the things which have drawn the respect of Colorado's people and public-information outlets.

A reporter called at Reef's office while notes were being prepared for this piece. He had taken several excellent 35-mm color slides of Colorado scenes, but explained apologetically that they were amateurish rather than professional. Reef's lightning mind was

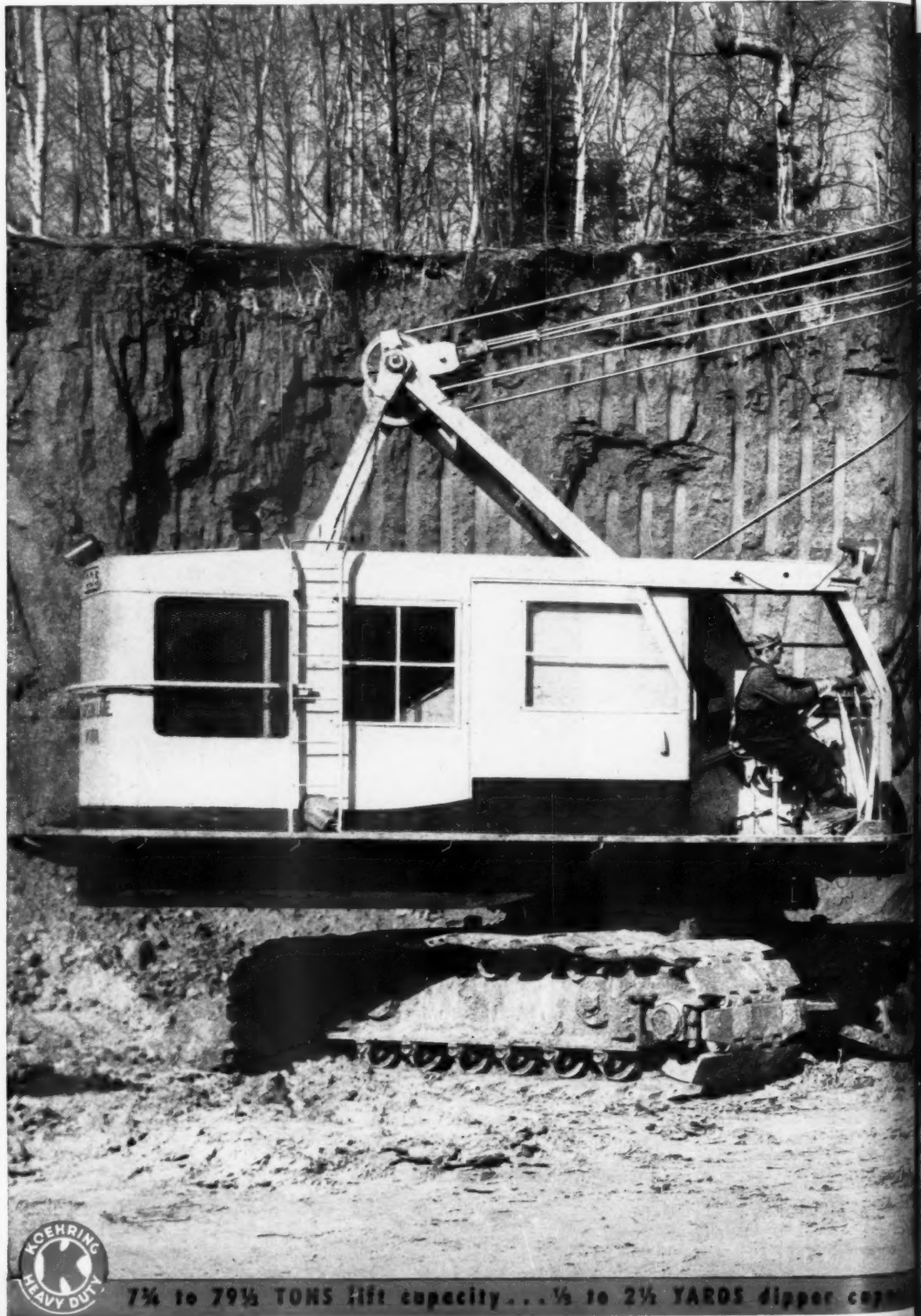
there with the angle. "Why don't you bring 'em down next time you come, Joe?" he asked. "Possibly we can get 'em copied and put 'em on exhibit at the State Capitol, with your credit line."

A new highway contract was let, calling for joint cutting with a concrete saw. The engineers explained that the sawed joints would make for a smoother ride. "True, true", said Reef, "but that's not all of the story. How many people know you can saw concrete?"

It seems to be inherent with engineers to forget that newspapermen, through necessity, are as intelligent as they are. Reef, like every good newspaperman, has a marvelous up-to-date education. Crammed in the back of his mind are countless bits of business of value to the improvement of public relations for the Colorado Highway Department. Let an engineer give him basic data for some highway-job news story, and the spice, the historical detail, facts about the community, terrain, adjacent landmarks, and so on spring

psychological and emotional persuasion—the subtle spice which makes logic a deadly thing. It is the knowledge of these things which makes for public acceptance of public programs, and only skilled experts with years of experience in public psychology know how to put it across. Very, very rarely does an engineer qualify even in its fundamentals. When an engineer comes along who is skilled both in his profession and in public relations, he is outstanding.

It was the realization of these factors



from Reef's background, alive and kicking, to sweeten whatever he writes. The engineers comment, "Say, that's pretty good." People say, "It's terrific!" Thus the secret, first of all, is to have a person with wide and thorough experience in public relations at the head of a public relations department—or at least that has been Colorado's experience. It takes a person who knows what makes news, where that news should go, how it should be prepared or delivered, and what chain of human relations he should follow. So far, most of these things are not taught in any college. Journalism graduates learn them, if they are good, after long years of experience. Then and only then are they competent to head such an important office as the public relations department of a state highway setup.

Reef, like Watrous, has a basic prejudice against spending public money to tell the public where its money is being spent. Colorado spends something like \$65,000 annually for public relations, including all expenses for



Colorado State Highway Engineer Mark U. Watrous, (left), stops by in the office of W. M. Reef, his public relations expert, long enough to look over a new release.

Reef's little four-person department. Every cent which is not turned back in the form of highway maps or something

similarly tangible is a source of agony to Watrous, who is a product of private enterprise first, last, and always.

The Public Relations Setup

Colorado's Public Relations Department is basically a simple, hard-working setup. Reef, its head, is a suave, distinguished-looking diplomat of the old school of good newspapermen. In 1915 he was a reporter on the *Rocky Mountain News*. He served briefly in World War I; returned to the *News* from 1921 to 1935 as makeup man, reporter, Promotion Editor, and City Editor. In 1935 he resigned to do some investigations, much of the background of which serves him well today. For many years he headed the KFEL newscast, one of the liveliest news programs in the Rockies, and was a successful free-lance writer in his own right.

Robert F. Bundy, Jr., his assistant, has the title of Information Officer. Bundy's background, too, has been in news reporting, and he regularly turns out astronomical amounts of copy along with running down research leads and other similar chores.

Frieda Economy, whose last name typifies the financial policy of the Department, is secretary and typist. Henry G. Elliott, a serious, hard-working youth, handles almost all the wrapping, mailing, and distribution of material filed by mail.

This small office turns out work rapidly, skillfully, and professionally. It writes a weekly 15-minute radio program which goes on the air without cost to the Highway Department from 11 radio stations in Colorado. This program's aim is to get the people better acquainted with the Highway Department and its problems, and public response has been good.

The Public Relations Department prepares a weekly news release for all weekly newspapers in the state, and gives spot news twice a day to major news services and the Denver papers. It does a monthly article in *Colorado Wonderland*, contributes articles on demand to an average of six other magazines a month, including technical journals, and helps to write most speeches given by Department personnel. It should probably be emphasized that Reef's main job here is to help arrange the technical material for best presentation and to supplement this with the personal touch which will help put the speech across. It cannot be described. People either have it or they don't. Reef has it.

The Department also puts out regular releases on contract lettings, which go to county commissioners, mayors, newspapers, and most radio stations. Special stories are prepared for local interested papers . . . a pueblo story goes to that vicinity and money is not wasted sending it to the other corners of the state where the material is not news.

The official Colorado highway map is designed in the Public Relations Department, and is one of the most eye-catching maps in the west. About 500,000 copies of this map are produced and distributed each year. As if all this was not enough to keep everyone busy, the Department found time a few years back to produce the movie "Snow Road", five copies of which have been worn out. The movie has appeared on television screens in New York City, Baltimore, Salt Lake City, Omaha, and Los Angeles, as well as before numerous private gatherings from coast to coast. The film was so interesting and convincing that the Bureau of Public Roads sent its Maintenance Chief from Alaska to Colorado to study snow-removal methods. Ripley missed that one.

The Department master-minded the Colorado Highway Department display at the Denver County Fair in 1951 and ran off with the First Prize blue ribbon for the outstanding industrial exhibit.

These are the routine things. But one of Reef's greatest personal contributions—aside from his willingness to work until midnight when need be, or

(Continued on next page)



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How One State Tells Its Highway Story

(Continued from preceding page)

hustle down to any whistle stop and make a speech before a service club—has been his help to Watrous and the Department in having the guts to stand up and fight. Until just a few years ago, vicious or unjustified criticism was never answered. The situation kept getting worse. And it never eased up or reversed itself until Watrous, Reef & Co. decided to stand up and slug it out, fighting innuendo with fact.

Ironically, it was a newspaper attack on Colorado's contractors as well as the Highway Department which caused Watrous' widely circulated "Highway Hysterics" to be conceived. The Colorado Contractors Association (AGC) now works very closely with Reef's office in maintaining good public relations, but when the criticism broke in 1948, Watrous and Reef penned

this (could you do it in your state?):

"HIGHWAY HYSTERICS"

"Hardly a day has passed in the last two years without some comment being published in a newspaper or on the radio about the State Highway Department.

"Critics have pried into every conceivable phase of the Department's operation. They have scamped up and down our highways, Sherlock Holmesing with microscopes and cameras, gleefully discovering a fugitive chuck-hole that wasn't even on the state highway system but was seeking to hide on an innocent county road. They have paraded from one state to another, gathering armloads of charts and statistics, burdening their cuffs with long interviews, and emerging from their jaunts as the most exalted of self-proclaimed 'experts'. Their howls have been heard across the breadth of the land, frightening tourists into avoiding Colorado and spending their vacations—and

their money—elsewhere.

"The bones of Shakespeare have been led forth, creaking, that Hamlet might jibe and jest. The cartoonist's pen has been dipped in fire, and even a comic strip scrawled to ensnare the emotions of the young—or somebody.

"Researchers have researched, adding adjective to supposition, and an investigating committee of the Colorado Senate has come up with two reports. The House has passed one highway bill, the Senate has rolled out another. At the moment the scene is confused with whitewashes, deadlocks, dead ducks, and screams of politics. No doubt the FBI, the Gestapo, the PTA and the Headless Horseman are lurking behind a budget to scare you if you don't watch out.

"Meanwhile, as one would say in the good old melodrama, the Highway Department has been going on with its chores, which consisted in awarding the greatest dollar volume of contracts in 1948 in the entire history of the Department.

"County commissioners, one of the groups of men who know highways best because they have to work and live with them, have repeatedly adopted resolutions in support of the Department's operations. And similar action has been taken by the Colorado Contractors Association, another group which merely builds the roads.

"The Public Roads Administration, which pays half the cost for primary, secondary, and urban highway construction, reports that of all the states in the union only Colorado and Texas, for the fiscal year ending June 30, 1948, succeeded in putting a full year's Federal appropriation to work in one year.

"In all this pulling and tugging, this frenzy for reorganization upon reorganization, there is one fact which towers higher than our loftiest peak. If the Department is stood on its head, turned inside out and outside in, not one fraction of a mile more of road can be constructed with the same amount of available money than can and is being constructed today.

"The cost of one mile of highway will not vary one penny whether there is a Highway Commission of three, nine, or seven hundred members. The only way a reduction in maintenance costs can be obtained is to enlist the full-time services of a weatherman who can control the weather, and for all anyone knows that may be the next 'reorganization suggestion' by the 'experts'.

"If the personnel of the Department were reduced by half, or doubled; if there were a dozen Highway Directors, in or out of the Civil Service; if the budgets and the accounting systems were controlled, supervised, and directed by the Controller, the Auditor, Western Union, and the Amalgamated Association for the Apprehension of Undotted I's, there would be no effect whatever on bid prices for highway construction.

"There is just so much money available to construct Colorado's highways. It isn't enough by 20 times.

"The economy, know-how, diligence, and direction of the contractors determines how much a given project will cost and how good it will be after it is completed. Bidding for highway contracts is a highly competitive business. That's the American system of free enterprise. It's a risky business. The efficient and resourceful survive.



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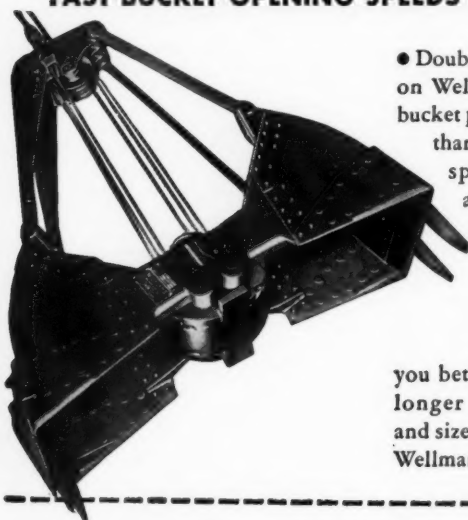
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"The contractors are going to have to build these roads; not the newspapers, not the political parties, not the Highway Commission, not the Highway Director, not even the 'experts'.

"The highway contractors are going to have to build the roads as economically as possible. They have to, or they won't get the jobs. They are going to build them as sound and strong as possible. They have to, or they won't get paid.

"They don't become hysterical in the midst of frenzy, because they know that rails and tears and the wringing of hands never helped build a bridge, ramp a fill, or lay a mat.

"Without the sincere conscientious efforts of the highway contractors of Colorado, the highway construction records of the last two years could not have been accomplished. Without such continued sincere and conscientious efforts, new records could not be attained in the years to come.

"When the turmoil has passed, and the 'experts' have departed for newer experiments on the more gullible, the highway contractors will be operating at the same old stand, doing the same good job.

"In the midst of hysteria, thank God for the contractors!"

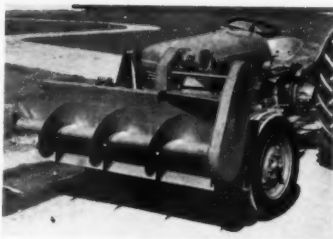
This statement was given wide circulation at the time, and its general contents have been circulated even more widely on the Highway Department's radio program and in various speeches. It speaks for itself. It is a concise, hard-hitting, highly readable defense of the modern highway department. When its story went out to the people, the pressure relaxed. Now the people, the press, various state committees and agencies, and the AGC are working together for a common goal: more money for better highways. The highway department is a respected agency, instead of a convenient whipping boy.

Few, if any, are the mysteries of civil engineering which cannot be solved by an intelligent newspaperman who has the cooperation of engineers. At least he can solve them to the point where he can describe them in language which everybody can understand and appreciate. The Colorado Highway Department is proving with every passing day that it is this intangible something, rather than the heavy complexities of engineering knowledge, which forms the true essence of worthwhile public relations.

An Auger Attachment

A new auger attachment for handling snow, gravel, and other loose materials has been announced by the Shawnee Mfg. Co., Inc., 1947 North Topeka, Topeka, Kans.

The Cyclone side-delivery auger attaches to the dozer blade and eliminates the side draft encountered in angle-blade dozers on light tractors. It is



powered by a direct drive from the power takeoff and can be installed on a Ford or Ferguson tractor in a few minutes. It rises and drops to the desired level with the bulldozer. Materials like snow, gravel, and loose dirt are windrowed neatly and efficiently, the company claims. The power line is equipped throughout with self-aligning sealed ball bearings.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 169.

Equipment Service Uses Only Three Lubricants

Literature on its new three-barrel lubrication plan is available from Shell Oil Co., Inc., 50 W. 50th St., New York 20, N. Y. The company points out that 95 per cent of all yardage can now be handled with machines completely lubricated by three Shell products.

Retinax A is a multipurpose grease recommended for the chassis, wheel bearings, universal joints, and water pumps. Spirax EP, an alloy-type high-pressure oil, is used for rear axles of the hypoid, spiral-bevel, and spur-gear types.

Rotella oil is a fortified, extra-heavy-duty lubricant for high-speed gasoline and diesel engines. The company claims that Rotella extends periods between overhauls by minimizing sludge formation, piston lacquering, ring and valve sticking, and port clogging.

This literature may be obtained from the company, or by using the Request

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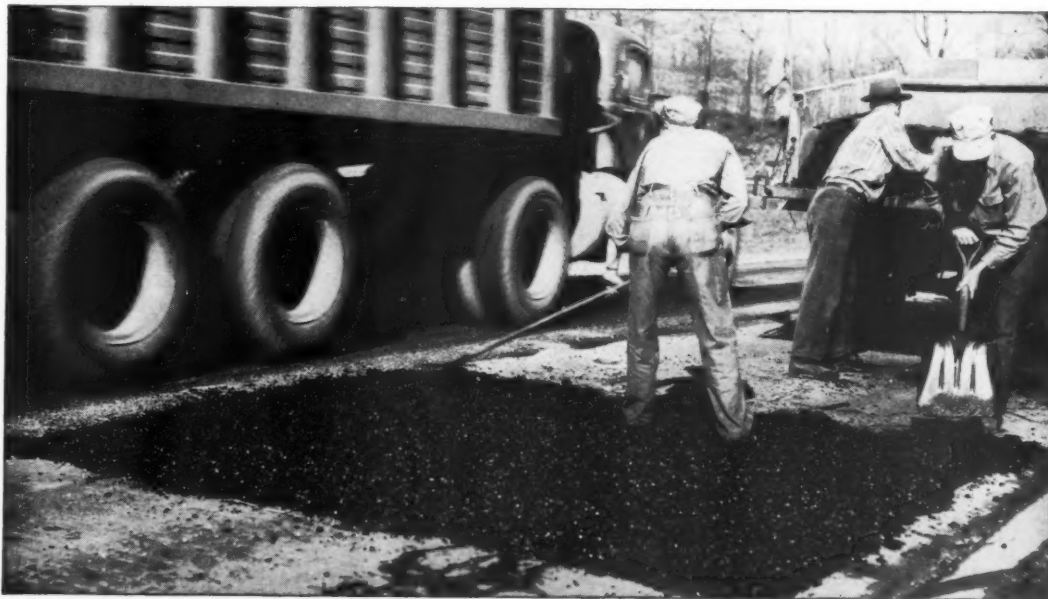
I-H Takes Over Hough

International Harvester Co., Chicago, Ill., has acquired the stock of The Frank G. Hough Co., Libertyville, Ill., manufacturer of earth-moving, excavating, and material-handling equipment. As of last month, Hough became a wholly owned subsidiary of International Harvester, and the Hough products, including Payloaders, now supplement I-H's line of industrial power and earth-moving equipment. There has been no immediate change in the organization of the company, and Frank G. Hough continues as President of the subsidiary.

Hough, established in 1920, has had many of its products marketed by International Harvester distributors in America and by Harvester's foreign-operations organization overseas. Before the acquisition, I-H was the largest single customer of Hough.

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THE PATCH under the moving truck was opened to traffic immediately. Notice, too, that Komac Premix does not stick to tools.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Convicted of Bribery In Contract Procurement

Without stopping to make a careful search through the appellate law reports to determine whether a high court in more than one instance ever upheld conviction of an American contractor for bribery or attempted bribery, it is safe to assume that the cases are at least very few in number. This observation is our only excuse for here presenting an abstract of the decision rendered by the Federal district court in Philadelphia in 1798. (United States v. Worrall, 2 Dallas Reports 384).

In 1797, the Government planned to erect a lighthouse at Cape Hatteras,

N. C., and a beacon on a nearby island. Worrall coveted the contract to be awarded, without being hampered by competitive bidding. The award was to be made by Commissioner Cox, Philadelphia, who had gone to Burlington, N.J., because of a yellow-fever epidemic in the City of Brotherly Love. Worrall sent this letter, which was addressed to the Commissioner at Bristol, Pa., but was forwarded to Burlington:

"Dear Sir: Having had the honor of waiting on you, at different times, on the light-house business . . . I will be bold to say, that when the work is completed in the most masterly manner, the job will clear, at the finishing, the sum of 1000 pounds . . . I have had,

this morning, a set of good carpenters, four in number, as emigrated from the old country, as also several stone-masons, offering themselves to go to Carolina." (There was also available a set of good secondhand blacksmithing tools.) "Therefore, good sir, as having always been brought up in a life of industry, should be happy in serving you . . . and always content with a reasonable profit; therefore, every reasonable person would say, that 1400 pounds was not unreasonable, in the two jobs. If I should be so happy in your recommendation of this work, I should think myself very ungrateful, if I did not offer you one-half of the profits . . . and would deposit in your hand, at receiving the first payment, 350 pounds, and the other 350 pounds at the last payment . . . I hope that you will not think me troublesome, in asking for a line on this business . . ."

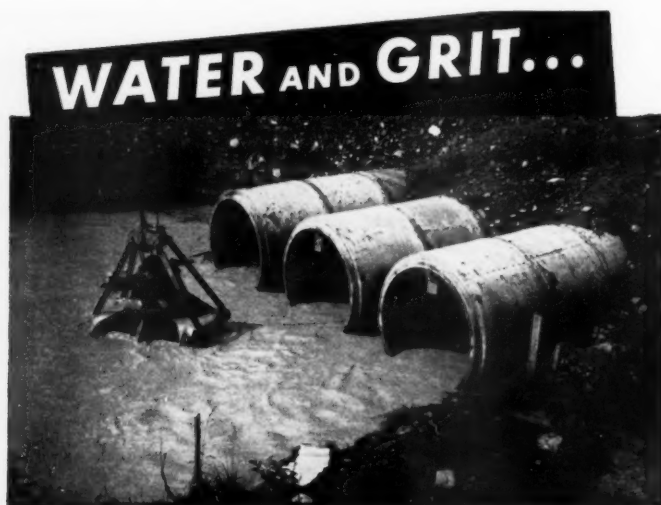
The Commissioner immediately reported the attempted bribery to the Pennsylvania Attorney, and Worrall was tricked into oral admissions, in

conferences ostensibly designed to further negotiations for a contract. In one conversation he boasted that he did not "let his left hand know what his right hand did".

A Federal grand jury in Philadelphia indicted Worrall, charging that he, a "yeoman, being an ill-disposed person, and wickedly contriving and intending to bribe and seduce the" Commissioner "from the performance of the trust and duty" reposed in the latter, "wickedly, advisedly and corruptly did compose, write, utter, and publish, and caused to be delivered" the letter.

A jury convicted Worrall. His counsel unsuccessfully argued that Worrall was not subject to prosecution in Pennsylvania, because the letter was delivered in New Jersey. But the two judges who presided at the trial agreed that the Pennsylvania court had jurisdiction, especially since Worrall repeated the attempt to bribe in the conferences held in Philadelphia after the letter was sent.

But the two judges could not agree



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as to the soundness of a second defense—that there could be no punishment because there was no Federal statute making such attempted bribery a criminal offense. This impasse led to the imposition of a compromise penalty—three months' imprisonment and a \$200 fine. The two judges agreed that there was no statute covering the case, but one of them thought that there was inherent power to punish such offenses against the Government.

Labor-Relations Suit

THE PROBLEM: A subcontractor, prejudiced by a secondary boycott against it at a construction site by unions asserting grievances against the general contractor, filed with the National Relations Board charges of unfair labor practice under Federal law. The Board informally dismissed the charges. The subcontractor withdrew its petition and brought a suit in a state court to enjoin the secondary boycott. Did the state court have a right to dismiss the suit?

THE ANSWER: Yes. (Corrado Bros. Inc. v. Building & Construction Trades Council of Delaware, A. F. of L., 88 Atl. 2d 433, decided by the Delaware Court of Chancery.)

Because the subcontractor admitted that interstate commerce was involved and had recognized that the matter was one over which the Federal courts had jurisdiction, the Delaware court said that a state court should decline jurisdiction. The court admitted that state courts may grant redress against violence of strikers in the protection of intrastate peace. But no violence was involved here. It was not necessary to determine to what extent Federal legislation has the effect of precluding state action. But in a case like this an aggrieved party should be required to utilize a remedy afforded by Federal law, even if it be conceded that there was an alternative remedy under state law.

Extension of Paving Required New Bidding

THE PROBLEM: After a paving contract had been awarded under competitive bidding at unit prices, additional paving was provided for, on petition of defendant and others whose property abutted upon the additional paving. Without receiving bids, the city extended the original contract to cover the additional work at the same unit prices. Were the modification of the contract and the lien against defendant's property void?

THE ANSWER: Yes. (City of Natchitoches v. Kile, 54 So. 2d 834, decided by the Louisiana Court of Appeal.)

The city argued that if a lien could not be enforced for the amount of the assessment, the city was at least entitled to collect an amount equalling the benefit to defendant's property resulting from the paving. This argument was rejected on the ground that that would indirectly recognize the void proceedings as valid.

Contractor's Inspectors Not Within U. S. Wage Law

THE PROBLEM: On a Federal job many of the construction materials moved in interstate commerce. Did the overtime wage provisions of the Federal Fair Labor Standards Act apply to inspectors, checkers, and expeditors of shipments employed in connection with the receipt of these materials?

THE ANSWER: No. (Shaeffer v. Fraser-Brace Engineering Co., 104 Fed. Supp. 871, decided by the United States District Court, Northeastern District of Tennessee, Northern Division.)

The court noted that the work performed was in the nature of an inventory, unconnected with the movement of the materials. The services were in-

cidental to preserving data as to costs on the job, which was contracted on a cost-plus basis. Broadly speaking, the employees were engaged in original construction.

Accordingly, the court dismissed a suit that had been brought by the employees to collect overtime wages at one and one-half times the regular rate fixed by the Federal statute.

Computation of Damages For Undelivered Material

THE PROBLEM: A subcontractor made an agreement to sell material excavated from a street. Under an agreement made after the subcontractor agreed to sell, were the buyer's damages for partial nondelivery computable with reference to the price at which he agreed to resell the material to a third party?

THE ANSWER: No. (Agabiti Bros. v. Catana, 86 Atl. 2d 592, decided by the New Jersey Superior Court, Appellate Division.)

The subcontractor having agreed to

sell the material at \$2 a load, the buyer's measure of damage was the difference between that price and the market value—if higher—at the time and place fixed for delivery.

The decision follows a well settled rule of law: loss of a special profit, at which a buyer of goods could have sold under a special contract with a third party, does not enter into computation of damages unless the seller entered in-

to the original contract with knowledge of the buyer's contract for resale.

Public-Works Wages

THE PROBLEM: Kentucky statutes require that prevailing wage rates be applied to public works. The statutes also provide that rates paid locally under union-employer collective-bargaining

(Concluded on next page)

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is designed for the purpose of heating and drying aggregate materials. The machine is particularly adapted to drying sand preparatory to mixing for black top road maintenance work. The material is discharged either mechanically or by hand into the hopper and thoroughly heated and dried in traversing the length of the drum. The Moorhead Drier may be furnished either as a portable unit with a standard two wheel trailer assembly or as a stationary unit with a heavy duty skid mounting.



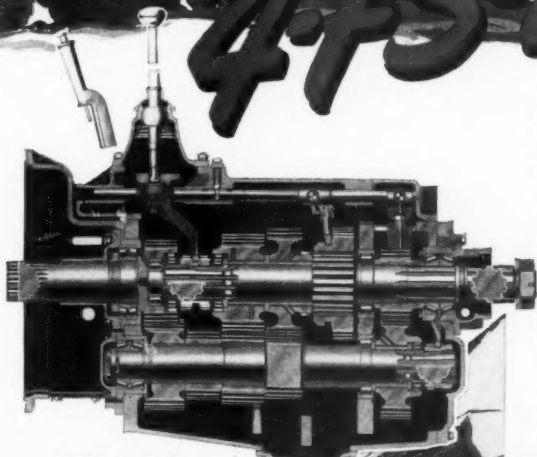
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Avoid Legal Pitfalls

(Continued from preceding page)

agreements shall be deemed prevailing wages if those rates apply to sufficient employees to indicate prevalence. A city board, after hearing union and nonunion laborers, decided that union rates prevailed in twelve crafts, but that, as regards carpenters, truck drivers, and common laborers, the prevailing rates were the lower wages earned by nonunionists. Were unions representing the latter crafts entitled to a court order compelling the city to pay the higher rates earned by union members of those crafts?

THE ANSWER: No. (Carpenters' Local No. 1650 v. City of Lexington, 248 S. W. 2d 407, decided by the Kentucky Court of Appeals.)

The unions claimed that union rates must be adopted if these were paid to a majority of all workers in the particular craft within the particular locality. They unsuccessfully contended that the evidence showed that union rates were paid to a majority.

Contractor Held Employer Of Driver Hired With Truck

THE PROBLEM: A highway contractor hired from a truck owner a truck with a driver. The driver was injured on the job and became liable for workmen's compensation. Was the driver's employer the highway contractor?

THE ANSWER: Yes. (St. Paul-Mercury Indemnity Co. v. Alexander, 65 S. E. 2d 694, decided by the Georgia Court of Appeals.)

The decision turned upon the fact that, although the driver was paid by the owner of the truck, both were under the control of the contractor as to when and how they should do their work; and that the driver was subject

to discharge if unsatisfactory to the contractor.

Failed to Cite Details, Prove Breach of Contract

THE PROBLEM: A contractor sued to recover pay under a cost-plus contract. The contract provided that a supervising engineer's \$150-per-week pay was to be allowed as part of the cost. In his defense, the owner alleged in general terms that the contractor had not complied with his contract obligations, but did not specify failure to hire a competent engineer. Did the owner thereby waive the right to assert that the engineer was not licensed as such in the state, as required by law?

THE ANSWER: Yes. (Cartwright & Wilson Const. Co. v. Smith, 52 N. W. 2d 274, decided by the Nebraska Supreme Court.)

Refusing to set aside judgment in the contractor's favor, the court observed that the evidence showed the jury had found that the work was done in a

workmanlike manner under competent supervision.

Covering a point of broad scope, the court said that where by statute, as in Nebraska, a contractor is permitted, in suing for compensation, to allege generally that he has performed all the conditions of the contract imposed upon him, it is up to the defendant owner to specify in what particulars, if any, the contract has not been performed.

Bond Covers Machine Rental

THE PROBLEM: Specifications required the contractor's bond to cover payment for labor, materials, and equipment rentals. Was the surety, then, liable for rental, repair, and transportation of equipment leased by the contractor, regardless of whether the lessor had any lien rights?

THE ANSWER: Yes. (American Surety Co. of New York v. Brummel, 184 Fed. 2d 935, decided by the United States Court of Appeals, Tenth Circuit.)

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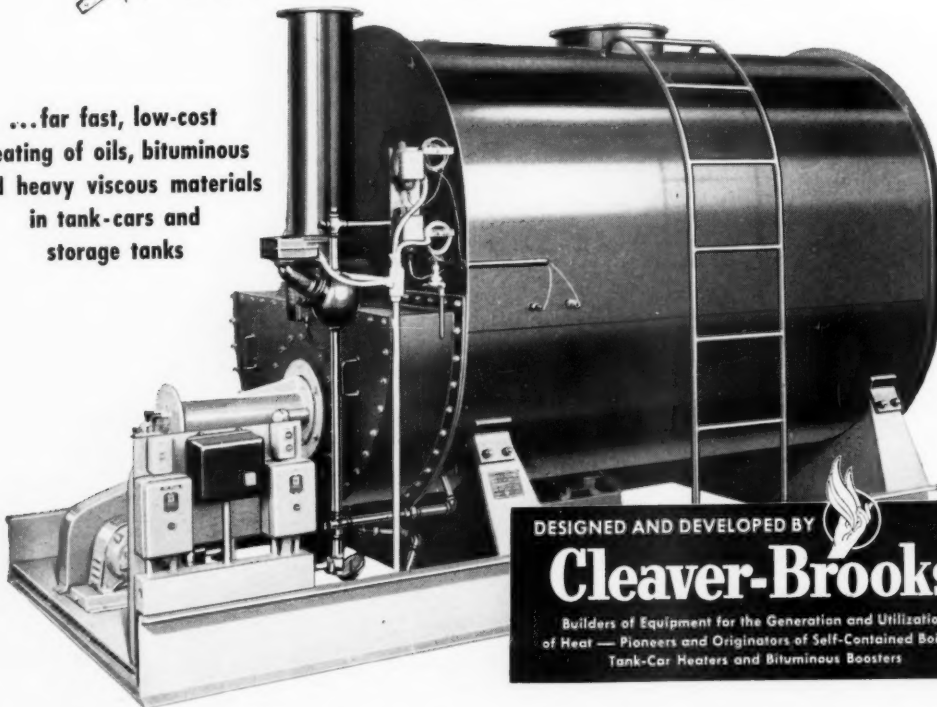


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NEW JERSEY—R. E. Brooks Co., Route 17, Box 17, Hightstown; Halbitz.

NEW MEXICO—R. L. Harrison Co., Inc., 1801 N. Fourth St., Albuquerque.

NEW YORK—Syracuse Supply Co., 76 Wall St., Blyhampton; 2080 Military Rd., Buffalo 17; R. E. Brook Co., 50 Church St., New York; Syracuse Supply Co., Portville Road, Oriskany; Van's Equipment Sales, Inc., Routes 9 and 20, Rensselaer; 1349 University Ave., Rochester; Syracuse Supply Co., 294 Ainsley Drive, Syracuse.

NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 5006, Asheville; P. O. Box 1205, Charlotte; Morris Ave., Knoxville; Tri-State Equipment Co., P. O. Box 128, Guilford; P. O. Box 553, Wilmington; 3101 Millboro St., Raleigh.

NORTH DAKOTA—Northwestern Equipment, Inc., 70 11th St., Bismarck; 501 Eighth St., Devils Lake; P. O. Box 110, Dickinson; P. O. Box 152, FARM; P. O. Box 335, Minot; P. O. Box 626, Wahpeton.

NEVADA—Sierra Machinery Co., 307 Merrill Ave., Reno.

OHIO—The W. W. Williams Co., 914 Main St., Cincinnati; 18301 Brookpark Rd., Cleveland 11; 835 V Goodale Blvd., Columbus; 1260 Conant St., Maum.

OKLAHOMA—The Victor L. Phillips Co., 101 Archer, Tulsa; 1222-24 W. Main St., Oklahoma City.

OREGON—Howard-Cooper Corp., Highway 98E, P. O. Box 445, Albany; Highway 98, P. O. Box 55, Camp Point; P. O. Box 1, Coquille; First and Van Buren Eugene; 5021 N. E. Gilman St., Portland 13; 228 E. 2nd Ave., Seaside.

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TEXAS—Alamo Iron Works, Brownsville; Corpus Christi Tri-State Equipment Co., 500 E. Overland St., El Paso; Conley-Lett-Nichols Machinery Co., 1311-19 E. Gray St., Dallas 1; Conley-Lett-Nichols Corp., 3601 Avenue H, Lubbock; Tri-State Equipment Co., P. O. Box 472, Odessa; Alamo Iron Works, San Clara & Montana Sts., San Antonio 5.

UTAH—Kimball Equipment Co., 222 W. 17th St., Salt Lake City 10.

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WYOMING—Slone Tractor & Equipment Co., East Yellowstone Highway, Casper.

ALASKA—Glenn Carrington & Co., s/o Westward Hall Anchorage.

CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Hume Canada, Ltd., Calumet St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Morton St., Toronto; Frost Machinery Co., Ltd., 921 Erie St., Winnipeg; Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.

Road-Building Boom Comes to New Mexico

"The Land of Enchantment" Expands the Traffic Capacity of Its Highways; 56 Major Projects Undertaken

ONE of the most dramatic examples of modern big-scale highway construction got under way this past summer in New Mexico, "the land of enchantment". From Tijeras Canyon on U. S. 66 to the whispering pines of Ruidoso; from Taos to Deming; north to south and east to west—reconstruction of New Mexico's highway system is under way. Dangerous obsolete sections of older highways are being realigned and modernized. New 4-lane divided expressways, unknown in the state until the first one was built near Clovis three years ago, are now becoming commonplace.

When a CONTRACTORS AND ENGINEERS MONTHLY representative visited New Mexico, 56 major construction projects were under way, in addition to routine maintenance by state forces and contractors. It is said that election years always turn highway planners into road builders, but the New Mexico construction program has a deeper basis. These projects are carefully conceived, soundly based on traffic studies, well engineered, and well built by good contractors with the latest in modern road-building equipment. It is significant that many of the jobs are large, and are located on the main highway system. For example, a contract held by Armstrong & Armstrong of Albuquerque amounted to approximately \$1,500,000, covered 27 miles of highway, and was located on U. S. 80 west of Deming, familiar to anyone who has used the southern route to the west coast.

The narrow, twisting, dangerous piece of highway on U. S. 66 in Tijeras Canyon is gone now. In its place is a modern 4-lane divided expressway, capable of carrying traffic safely at high speed. Improvements have been made on Raton Pass, and on U. S. 66 all the way from Tucumacari to Gallup. And while

the emphasis has properly been on the main transcontinental system, the state secondaries have not been forgotten. Back roads like the one between Hanover and Silver City have been improved as funds became available.

Standards are high. Pavements in general are 24 feet wide, set on the heaviest gravel bases and compacted earth subgrades the budget will allow, and are of asphaltic concrete if possible. The shift from asphalt pavements of lower quality is being made because modern hot-mix asphalt plants have been introduced. These are capable of turning out accurately controlled asphaltic-concrete pavements at high speed and much lower unit cost than ever before.

The story of New Mexico's road-building boom is more than a technical recital of engineering and construction facts, important as those things are to the future stability of the new projects. It is one of cooperation between a state agency and its contractors. It is a story of a battle between construction men and the elements of nature; of private enterprise at its best. When any one of the current projects is considered in this broad light, the technical details have meaning even to a layman interested in better highways at lower cost. The design and investigation of highways, the selection of a type of construction, a contractor's selection of key men and equipment, and even the way a job is run, all represent an interesting battle with the laws of economics.

A Sample Project

Nowhere in New Mexico is this background exemplified better than, for example, on a big job recently completed near Deming. When this improvement work started in May of 1951, Armstrong & Armstrong were low bidders on a



A section through Tijeras Canyon, east of Albuquerque, New Mexico, where the road was improved through mountainous country to modern 4-lane standards.

12-mile \$527,000 improvement. Later, when an adjoining 15-mile section was let, this company was able to bid it at \$900,000. This bid was low, and the two projects were tied together for construction purposes.

This 27-mile improvement takes off at Deming's westerly city limits and passes straight as a die over an entirely new location, eventually hooking back in to U. S. 80 far to the west. The straight alignment cuts 2 miles off the old distance. It is on better natural ground, so the excessive maintenance costs of the old highway should not be repeated on the new. Its planning exemplifies a new line of thinking by highway engineers, for the right-of-way was purchased wide enough to accommodate a 4-lane divided expressway. This job consists of a 2-lane road but those two lanes are set in the right spot on the right-of-way so that future work will construct the other lane in its proper location, whenever traffic counts indicate its need.

The earthen base is raised about 4 feet off the surrounding country, because engineers have found that this helps winter winds to keep the snow blown off. It also reduces summer danger of flash floods overtopping the high-

way. As a matter of fact, the drainage provisions were so extensive on this job that about 40,000 cubic yards of concrete had to be placed in culvert structures. This earth base tops off at 53 feet in width. Centered on it is a crushed screened-gravel subbase course, 44 feet wide and from 6 to 15 inches deep. Placed tight, and at high bearing value, this material distributes much of the traffic load underneath the pavement. The pavement is a 2-inch mat of asphaltic concrete, placed in two 1-inch courses. To get a bit more asphalt strength, the gravel subbase was treated ahead of paving with a special application of MC-1 penetration asphalt, which went down about 1/2 inch into the base. This stiffened the top surface of the base and sealed it from rain penetration before the asphalt hot-mix was placed.

Major Grading Job

The preparation of the earthen base called for the movement of over 750,000 cubic yards of dirt: big excavation in any language. However, the job resolved itself into a number of spreads, balanced as to quantities, in increments of about 2,000 feet. A pair of Tourn-

(Continued on next page)



The operator, with a pyrometer in easy view to show him the temperature of his mix, dumps hot-mix into a truck as the Pioneer plant churns out more material.



Looking down on the Pioneer asphalt plant from the aggregate pile. The unit put out 150 tons per hour with 6 per cent moisture in the aggregate.



Working against a cloudy New Mexico sky, this Barber-Greene finisher lays pavement on U. S. 80 west of Deming. The new alignment cuts 2 miles off the old distance.

Road-Building Boom Comes to New Mexico

(Continued from preceding page)

pulls, two Euclid self-powered scrapers, and a Caterpillar elevating grader-loader and trucks all saw their share of service. To get enough dirt to build the roadbed up above the surrounding terrain, considerable borrow-pit work had to be done.

Where the dry weight of the soil was less than 120 pounds per cubic foot—and concrete weighs only 150—specifications called for 95 per cent compaction, based on the best known methods developed in engineering laboratories. For soils weighing more than 120 pounds, 90 per cent density was specified. These high densities, which make the soil stand up under today's traffic, are never arrived at without hard work and care. For example, it required an average of 50 gallons of water per cubic yard of dirt to compact the material. Long water hauls were often necessary. Heavy rolling—by sheepfoot rollers, an experimental 100-ton rubber-tire compactor, and smaller pneumatic compactors—was necessary to squeeze the dirt into its designed shape. The finished roadbed is tight and strong.

Modern Crushing Equipment Used

It used to be that highway engineers could get the gravel they needed practically anywhere, but those days are disappearing. Crushed rock is usually better, because the angular particles have an interlocking effect which adds to strength. Thanks to modern portable crushing and screening plants, engineers no longer are alarmed when the native gravel pits within economical hauling distance become depleted. Plants such as the contractor brought in to the Deming job can turn out astronomical amounts of rock, as we shall see.

This was a major rock job. In addition to the production of all concrete aggregates for the 40,000-yard culvert job, some 42,500 tons of finely prepared mineral aggregates were necessary for the hot-mixed asphaltic concrete. Three-inch ballast and 1-inch leveling courses of granular subbase material accounted for another 300,000 tons of graded rock.

Gradation tolerances for some of the typical materials, specified to give the best possible job, were as follows:

Ballast Course:	
Screen Size	Per Cent Passing
3-inch	100
No. 4	35-90
No. 10	30-70
No. 200	6-15
Liquid Limit: 35	
Plasticity Index: 6 or less	

One-inch Leveling Course:	
Screen Size	Per Cent Passing
1-inch	100
3/4-inch	85-100
No. 4	40-70
No. 10	30-55
No. 200	6-15
Liquid Limit: 25	
Plasticity Index: 6 or less	

Hot-Mix Mineral Filler:	
Screen Size	Per Cent Passing
3/4-inch	100
3/16-inch	60-80
No. 4	42-60
No. 10	30-46
No. 40	12-24
No. 200	3-8

Since the specifications were so varied and the job was so long—three setups were necessary—a modern plant was indicated with features of portability, flexibility, and high-tonnage potential at low unit cost. Armstrong & Armstrong purchased a new Pioneer 46-VE Duplex rock plant and moved it in to the job on its own wheels. Ballast and leveling-course material was produced in the first two pits on the west end of the job. An especially big setup was then made near the east end of the combined project, where all the mineral filler for the hot-mix was made, along with additional ballast and leveling-course material for that end. Concrete aggregates were also made in this pit.

According to General Superintendent Ben Kelly, some excellent performance figures were made by the Pioneer plant on its first job. So portable was the machine, for example, that moves were made in from two to three shifts. On the east pit, where the formation was more favorable than the other pits, the plant turned out an average of 3,500 to 3,600 tons of ballast-course gravel every 9 hours, with 2,350 tons of 1-inch leveling-course material. On the other pits, where the formation was not favorable, average ballast-course production was 3,200 tons per 9-hour shift and 2,200 tons of leveling-course material. The Pioneer 46-VE plant is an ultra-modern rock plant, and many of its features were tailor-made for the Deming job. For example, pit-run material which met the specifications was quickly taken out of the mix from the bottom-screen deck, as the intruding material passed into the plant. Thus only such material as required working over was sent on to the big jaw and twin 40 x 22 roll crushers.

Flexibility of adjustment of the various crushers also paid off as the characteristics of the pit material changed. Crusher adjustments can be made even while the machine is running. A good crusher operator balances the crushing job between the jaw and rolls, and this was no exception. "Possibly the most dramatic example of that flexibility was when we were making concrete aggregates", Superintendent Kelly explained. "Of course the pit was favorable, but, so help me, that plant was so flexible and easily controlled that we were turning concrete aggregates out of one side of the plant, and sand out of the other. Both were exactly right for the specifications, and there was no waste material."

Granular base-course material turned out by the plant was trucked to the highway, blade-mixed, watered, laid out, and rolled down tight by rubber-tire rollers. The hot-mix material was trucked over to the asphalt-plant location and dumped. There was some segregation of particles in this process which caused some worry for a while, but certain built-in features overcame this problem and the plant finished the mammoth job without excessive maintenance.

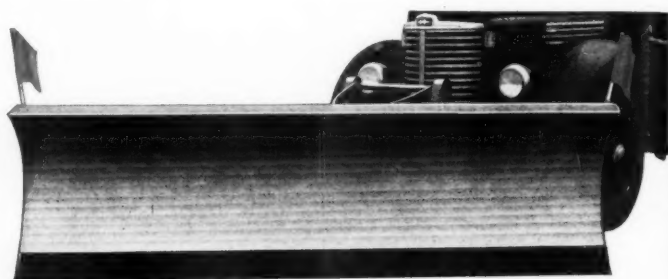
Interesting Hot-Mix Work

As a rule, contractors and their superintendents like to take a vacation and go fishing sometime during the

summer, but they never do, because the average summertime job is a constant battle against time, especially in the high country of New Mexico.

Ben Kelly had worked his 27-mile job well indeed, because he realized that the 42,500-ton hot-mix-pavement schedule could put him on the spot unless roadbed and subbase were pre-

pared ahead of time. To do this, he had to work through the winter of 1951-52. Subcontract arrangements were made with Tri-State Paving Co. of Albuquerque to mix and lay the asphaltic concrete. But the usual problem of time developed. The plant which Tri-State intended to use was set up on the big Tijeras Canyon job on U. S. 66, work-



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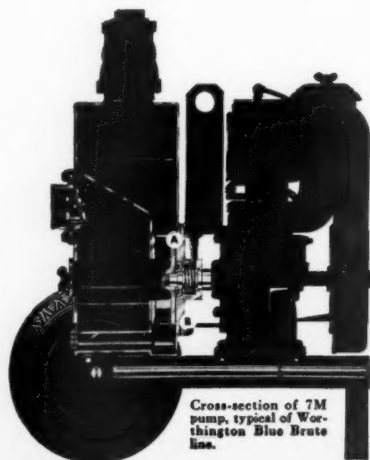
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1951-52
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3, work-

ing against all the odds Mother Nature could throw its way. This plant—a Continiflo—is also of Pioneer manufacture. Designed to turn out 125 tons an hour when the moisture content of the aggregate is 5 per cent, it was making a successful showing under overload conditions, and turning out 150 tons an hour with 6 per cent moisture in the aggregate, to get as much as possible of this vital job finished before winter.

Theoretically, the big plant should have been able to make its 250-mile move to Deming on schedule. But ground-water seepage started under parts of the new highway, and to make the roadbed right, the engineers and the contractors tore up and rebuilt enough of the highway to hold the plant at Tijeras a month longer than it was supposed to stay. The Deming job, meanwhile, was running into tight completion time of its own. Tijeras Canyon was finished on Tuesday morning, and the plant was quickly cooled down, demobilized, and loaded. It took 8 trucks, 2 dump trucks, 7 trailers, and a flat-rack tow trailer to carry the hot plant. The complete job of demobilizing, moving 250 miles, reassembling, and so on was made in a week, at the end of which the plant was operating at Deming, on a setup placed about 7 miles from the east end of the job.

Operating conditions at Deming were more favorable. The aggregate contained only 3 per cent moisture. According to the theoretical time schedule, enough working days remained so the plant could be operated less strenuously. Output was set up around a schedule of about 1,000 tons per 9-hour run; or close to the plant's designed capacity. Actually, in the first 21 paving days—and not all were full shifts due to weather—the plant turned out 18,000 tons of material. The only change made in the plant was the substitution of an apron feeder for the plate feeder under the aggregate bins. This gave a uniform feed. Coupled with the excellent asphalt-proportioning system, which was automatically tied in to the aggregate feed, excellent control was possible. State laboratory technicians at the job reported on-the-nose accuracy of mix, both as to proportion and yield.

The mix called for 6 per cent of 120 to 150-penetration asphaltic cement. It was trucked in from Big Spring, Texas, and stored for use in a pair of 12,000-gallon tanks, heated by circulating hot oil from an auxiliary heater. The No. 5 burner fuel for the big revolving dryer in the plant was stored in a tank of similar size.

Although the dumped mineral aggregate had segregated, the Continiflo plant screens did a beautiful job of reblending this material. Plant Superintendent Claude Arris likes to have his plant running at capacity, so he never hesitates to use an extra truck around the plant and haul an occasional load of rejected aggregate back to the stockpile. He has also installed pyrometers at the dryer and at the pugmill operator's platform, so the mix temperature can be held around 275 degrees more easily. Some minus-200 filler material is being added at the Pioneer feeder trap.

The basic maintenance-production relationship on any operating setup is well illustrated by a comparison be-



Ray Folk, Resident Engineer, and Armstrong's Superintendent B. Kelly.

tween the Deming and Tijeras Canyon jobs. At Tijeras Canyon, where operating conditions were overloaded and tough, it took 1.75 gallons of dryer fuel per ton of material, and about \$2,000

worth of maintenance in the firebox was done. At Deming, operating just about at plant capacity under better conditions, maintenance was negligible and the fuel ratio dropped to 1.25 gallons per ton. "Seems like these plants will certainly take an overload with a little more maintenance, all right," said Arris.

According to Arris, that \$2,000 maintenance figure at Tijeras Canyon can be scaled down \$400 because of a smart Indian, and Arris' gullibility.

"This fellow introduced himself as an Oklahoma Indian, and said he'd cure my firebox trouble with a special glazing process. Said he'd guarantee the job 5 years. He showed me a sample of this glaze on a brick, and when I tried to break it down with a cutting torch, I couldn't touch it. We let this guy go ahead. Personally, all I think he did was to paint the firebox with red paint. When he finished we paid his \$400 charge, and he gave us a signed 5-year guarantee, and left. We haven't been able to find him since, and we'd like to,

because our firebox maintenance on that job continued exactly as before."

Trucks, rented on a ton-mile basis, hauled the hot-mix out to the job, where it was laid by a Barber-Greene Finisher. The material was rolled by two 12-ton steel rollers, with rubber-tire rolling sandwiched between. This rolling tightened the surface texture to a point where no seal-coat work is expected for the next year or two.

All over America, the problem of obsolete highways and ever-increasing traffic remains a major headache. Maintenance costs are staggering, and in the meantime accidents are piling up. The only obvious solution, as engineers have explained over and over, is a complete rebuilding job, with main highways on permanent alignment and built to stand up under the loads of today and tomorrow.

New Mexico's 1952 construction program shows a sharp awareness of this fact, and the State is well on its way in its program of doing something about it.

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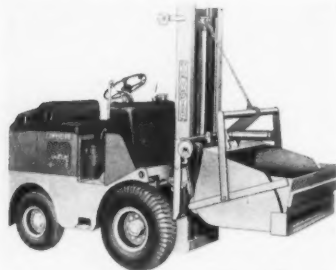
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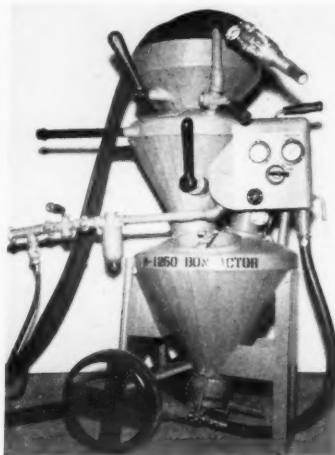
New Concrete Placer

A new Bondactor model for air placement or gunning of concrete and other materials is announced by Air Placement Equipment Co., 1009-11 W. 24 St., Kansas City 8, Mo.

The Model No. 1250 features a new air-recovery system for exhausting motor air into a material-carrying airline and not to the atmosphere; a 3-hp rotary air motor that drives agitating and feeding mechanism and is said to provide steady continuous operation with all materials and aggregates; a new material-metering and shut-off valve for easy control of material flow; and a new upper material valve which is said to give a more positive seal and has a valve cone for easy cleaning.

The Bondactor guns everything from heaviest chrome-type refractories to lightest-weight insulating concretes, the company claims. It is available in two sizes, Model 1250-L and Model 1250-S. The patented Bondact gun is furnished with both machines, for best possible hydration and minimum rebound of air-placed materials, the company says. The Model 1250-L operates with a 210 or larger compressor and has a maximum capacity of 3 cubic yards of concrete aggregate per hour. The Model 1250-S operates with a 105-cfm compressor and its maximum capacity is 1 1/2 cubic yards per hour. Production capacities with other materials vary, since some are gunned more rapidly and others more slowly than concrete.

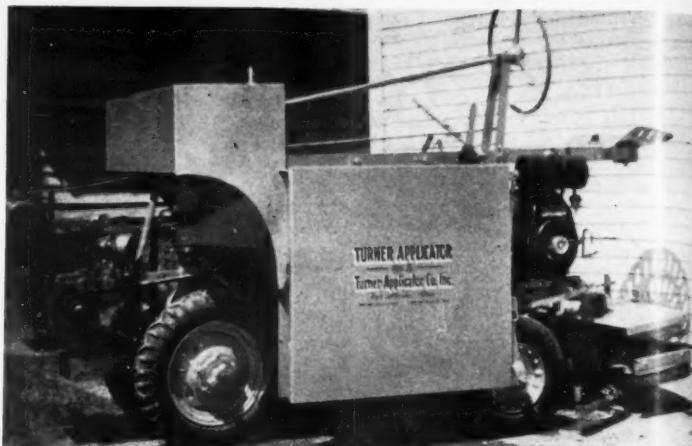
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Steel Institute Officers

John E. Jackson, President of Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa., has been elected President of American Institute of Steel Construction, Inc., New York, N. Y., in succession to R. D. Wood, Chairman of Mississippi Valley Structural Steel Co., Chicago, Ill. Mr. Jackson served as First Vice President of the Institute for two years prior to 1947, when he became a member of the Board.

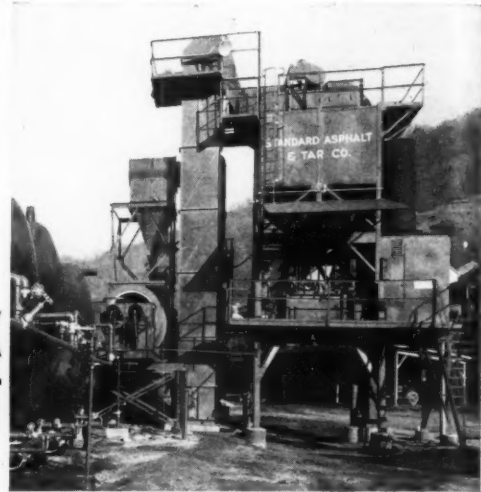
Other new officers are: First Vice President—Earle V. Grover, President of Apex Steel Corp., Ltd., Los Angeles, Calif.; and Second Vice President—N. P. Hayes, President of Carolina Steel & Iron Co., Greensboro, N. C. Re-elections include: Treasurer—James M. Straub, President of Fort Pitt Bridge Works, Pittsburgh; Executive Vice President—L. Abbett Post; and Secretary—M. Harvey Smedley. Nine directors were elected to serve until 1955.



This 125-gallon distributor made by Turner Applicator Co., Inc., Port Jefferson, Ohio, can be used for sealing bituminous streets. It is distributed in the New England, Middle Atlantic, and Southern states by Maintenance Engineering Co., 16 W. Johnson St., Philadelphia 44, Pa. For further information, write to the dealer or use the Request Card at page 18. Circle No. 156.



PA-20 HOT MIX ASPHALT PLANT



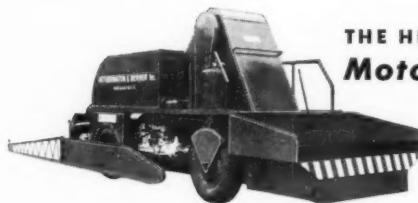
Easily Portable by Truck . . . Efficient on Small as well as Big Jobs

H & B PA type plants are designed especially for the contractor who moves frequently, and who must be able to get efficient production on small as well as large jobs—under a wide variety of operating conditions.

PA plants are particularly adapted for moving by truck or trailer. If desired, the dryer and the mixing-weigh unit can be furnished with tandem axle and fifth wheel.

These plants may be driven with individual electric motors or from one main power unit for the tower and one for the dryer. Gasoline, diesel, diesel electric or electric power may be used.

All PA plants are completely assembled and checked at the H & B factory before shipment. See your local H & B distributor, or write for Bulletin P-46.



THE HEAVY-DUTY Moto-Paver

The H & B Moto-Paver does the complete mixing and laying job—in one continuous operation. This heavy-duty model is especially designed for heavy mixing, retreat and stabilization jobs under the toughest of operating conditions. No other method or machine can produce comparable results at comparable cost. Write for Bulletin MP-49.

HETHERINGTON & BERNER INC.
Engineers—Manufacturers
731 Kentucky Ave. Indianapolis 7, Ind.

Distributor Doings

AED Region 11 in Fall Conference Plans Cooperation With the AGC

By BEAL SHAW, Regional Director, Associated Equipment Distributors

Members of the Associated Equipment Distributors in Region 11 (composed of distributors in Arizona, California, Nevada, and Hawaii) held a three-day conference in Santa Barbara, Calif., last October.

The outstanding feature of the meeting was the cooperation of the Associated General Contractors of America with the AED to bring about a clearer understanding of contractors' problems. Emphasis was laid on what AED members could do to cement relations and bring about a more mutually profitable contractor-dealer-manufacturer association. Among the speakers—all from California—representing AGC were: H. O. Parish, of Parish Bros., San Francisco, President of the Northern California Chapter of AGC; J. A. Thompson, of J. A. Thompson & Son, Inglewood, National Director of AGC and Past President of the Southern California Chapter; W. D. Shaw, Manager of the Southern California Chapter of AGC; and Jack Howe, of Edward R. Bacon Co., San Francisco, Past Director of AED Region 11.

Among subjects reviewed was the \$2,000,000,000 construction program slated for the Pacific Southwest in the record-breaking year ahead. How this business could be "sewed-up" through advertising was told members by H. J. Mayer, Western Machinery Co., San Francisco. Other topics were manufacturer relationships, service, and finance.

The conference was headed by Beal Shaw, Shaw Sales & Service Co., Los Angeles, Director of Region 11. AED speakers included: H. J. Hush, of Griffin Equipment Co., New York, President of AED; Al Garlinghouse, of Garlinghouse Bros., Los Angeles, Past President of AED; and Geo. B. Brose, of Merrill-Brose Co., Oakland, Calif. Jack Randle, AED Field Secretary, gave a talk on AED across the nation and a summary of AED group insurance. Another highlight was an address

by H. R. Land, McKinsey Co., Los Angeles, Calif., on some important factors affecting long-term management success. He urged members to do more planning with a definite objective in mind and to stick to this objective and thereby accomplish the goal.

Two unscheduled speakers on the program were Ed Siple, President of the Excavating and Grading Contractors Association, and Lynn Bradner, Executive Secretary of that Association, which was organized a few years ago. They told the group how the organization already boasts well over 300 members with new branches now



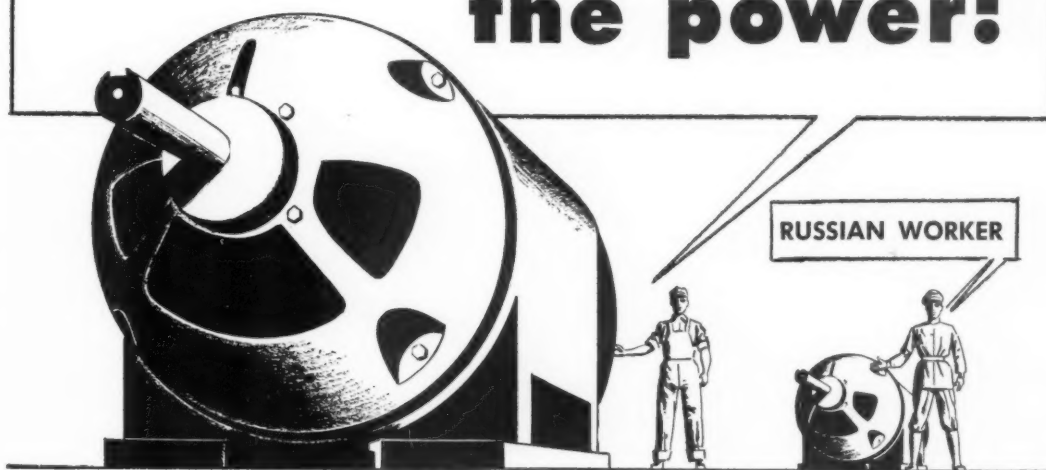
Members and guests of the AED, Region 11, winding up another day of the three-day conference held this fall in Santa Barbara, Calif.

being formed in San Diego and Oxnard, Calif. The purpose of this organization is to benefit contractors who are not big enough to meet standards and qualifications for AGC membership. The EGCA now makes it possible for its members to bid on million-dollar jobs through pooling of equipment and resources.

On the social side, the meetings began Monday, following a Sunday devoted to registrations and the annual golf tournament, at which W. W. Colley, partner in Brown-Bevis Industrial Co., Los Angeles, Calif., walked off with the laurels for the seventh successive year. The conference wound

(Continued on next page)

AMERICAN WORKERS HAVE 7 times the power!



How does America do it?

Why does the American worker have the help of about 7 times as many kilowatt-hours of electric power as is available to the Russian worker?

How can we Americans produce over 40% of the world's goods and bring so much more of everything to everybody with less than 6% of the world's population? Why is the American output per-man-hour still growing faster and faster?

The answers cannot be laughed off nor are they hard to find. In the words of Ralph J. Cordiner, president of the General Electric Company: "The greatest impetus for forward movement still comes when individuals are free to plan and carry out their own ideas without government coercion or unnecessary regulation."

Including estimated expenditures in 1952, private industry in the last seven years will have invested over 150 billion dollars in new plant and equipment. This contrasts with Federal Government investment of not much more than 12 billion for similar purposes in the same period. Moreover most such Government expenses during the last three years have been allocated

to military and atomic projects.

Back of all this progress in private industry is the unique American system of competition—our kind of competition that continually stimulates Americans to make things better and to sell them better—and at lower prices.

In America we do not just compete for public office; we also compete in technology, competency of management, individual initiative and distribution—the latter including selling and advertising in all their varied forms.

Our kind of competition promotes the growth of more and more businesses and industries—and this means more jobs and expanding prosperity from which we all benefit.

"Planned economies" and other fancy theories are not for us. The American competitive system has given us the highest standard of living in the world. Let's all work to preserve it.

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The 1952 Edition of
**CONTRACTORS AND
ENGINEERS MONTHLY'S**
"Where To Purchase
Guide"
is now available.

If you wish a copy of this pocket - size booklet of names and addresses of manufacturers and suppliers of hundreds of construction products, circle No. 205 on the reply card to be found in this issue facing page 18 and mail card to

**CONTRACTORS AND
ENGINEERS MONTHLY**

470 Fourth Avenue
New York 16, N. Y.

THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

Distributor Doings

(Continued from preceding page)

up with a well-attended dinner-dance and show in the Loggia Room of the Santa Barbara Biltmore Hotel.

Davey Appoints Seven New Dealers

The Davey Compressor Co., Kent, Ohio, has appointed seven new distributors. They are: Equipment Rental & Sales Corp., 1211 S. Fifth St., Minneapolis, Minn. (territory—southern half of Minnesota); Clark County Wholesale Mercantile Co., Inc., 512 S. Main St., Las Vegas, Nev. (territory—southeastern Nevada); New Mexico Equipment Co., 701 E. Coal St., Albuquerque, N. Mex. (territory—New Mexico); Bradley Industrial Supply Co., 328 E. Third St., Borger, Texas (territory—Texas Panhandle); Baker Equipment Engineering Co., Summit and Norfolk Sts., Richmond, Va. (territory—Virginia, North Carolina, and South Carolina); The Stanco Co., 1914 Canton St., Dallas, Texas (territory—operations in Texas, Louisiana, and Kansas); and San Antonio Equipment Co., 661 Main Ave., San Antonio, Texas (territory—south-central Texas).

These dealers will handle the entire Davey line, which includes portable and stationary compressors (60 to 315-cfm); Auto-Air (truck-mounted) compressors; field service units; mobile machine shops; and heavy-duty-truck power takeoffs.

Dealer Combines Business and Fun

Over 3,700 contractors, industrial and materials-handling personnel, and public officials attended a barbecue and equipment show in Philadelphia, Pa., last September, sponsored by Service Supply Corp. and Austin Supply Co., both of Philadelphia.

Just off Route 1, in north Philadelphia, several acres of ground were laid out to exhibit tractors, cranes, graders, loaders, fork-lift trucks, compressors, mixers, scaffolding, and many other types of equipment. A grandstand, made of Universal Scaffolding, was set up for viewing the equipment demonstrations, which continued for 7½ hours and included: International-Harvester's training van with its own instruction crew and a cutaway of an International

diesel engine to show what makes tractors tick; the Jaeger family with its compressors, pumps, building mixers, and truck mixers; an International Harvester TD-24 pushing dirt with a Bucyrus-Erie blade and then digging up the earth with a B-E scraper; Service Supply's own Lodover digging and unloading overhead into a truck; and the grading of a road with an Adams grader. Also displayed were the new P&H Miti-Mite, a 35-ton P&H truck crane with 110-foot boom, the Warner-Swasey Gradall, Trojan Loadsters, and Buda fork-lift trucks. Whiteman, Silent-Glow, Stow, Thor, Gar-Bro, Wickwire, American, and many other manufacturer lines were also represented.

The following week at the same location, Service Supply Corp., with its complete sales force and executive group, learned to operate all the equipment which had been displayed. To teach the salemen the fundamentals of the equipment, each manufacturer assigned at least one factory representative to each piece of equipment. Said "Corny" Whetstone, Sales Manager of Service Supply Corp. and in charge of this training operation, "Our men are sure to be better salesmen as they now understand the man in the seat's viewpoint of equipment."

New Dealer for Cleaver-Brooks

Western Traction Co., 2230 Third St., San Francisco 7, Calif., has been appointed northern California distributor for the Road Machinery Division, Cleaver-Brooks Co., Milwaukee, Wis. The firm will stock a complete line of parts and provide service on all items in the company's road-machinery line, including mobile, portable, and stationary steam boilers; tank-car heaters; bituminous boosters; Peak-Temp oil boosters; Deuce combination tank-car heaters; and pumping boosters.

The dealer maintains three branch offices: Contractors Equipment & Supply Co., 1143 C St., Fresno; George M. Philpott Co., 725 Thirty-Third St., Sacramento; and W. E. Pierce Co., Fourth and Broadway, Eureka, Calif.

Syntron Birmingham's New Office

The Syntron Birmingham Sales Co. has opened new offices at 1831 29th Ave., S., Birmingham, Ala. Sales operations are under the direction of A. H. Brush, formerly associated with Syntron Baltimore Sales Co.

Syntron Birmingham Sales handles equipment manufactured by Syntron

Co., Homer City, Pa. This includes vibratory material-handling equipment, portable power tools, and diesel pile hammers.

Rish Acquires Virginia Firm
Rish Equipment Co., Bluefield, W. Va., has acquired Bristol Truck & Implement Co., Bristol, located on the

MADSEN Simplicity
...and what it means to you

Look at the simple, clean-cut design of this MADSEN Asphalt Plant. This simplicity is the result of superior engineering and helps to make MADSEN plants more economical to operate and maintain...tops in fast and thorough mixing...and outstanding in profitable day-in and day-out operation.

MAKE YOUR NEXT ASPHALT PLANT A MADSEN

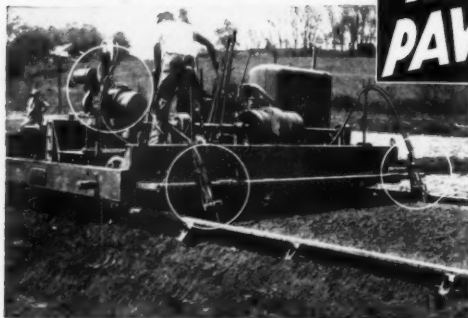
MADSEN IRON WORKS, INC.
P. O. BOX 589 • HUNTINGTON PARK, CALIF.

Heltzel
BUILDS IT BETTER

HELTZEL HELPS CONSTRUCTION DOLLARS GO FURTHER

HELTZEL ON THE JOB

Maginniss HI-LECTRIC CONCRETE VIBRATORS ON THE JOB-



VIBRATING HIGHWAY PAVEMENTS

NO FLEXIBLE SHAFTS

ELECTRIC MOTOR IN HEAD

REMOTELY CONTROLLED BY OPERATOR

With a Maginniss HI-LECTRIC Vibrator, concrete placing in any type of form is faster, cheaper, effortless, with a better looking job when the forms are removed.

Maginniss POWER TOOL CO.
MANSFIELD, OHIO

with
RAYMOND CONCRETE PILE COMPANY
at
GREAT LAKES STEEL CORPORATION

PROBLEM: High capacity batch plant to simultaneously charge both a pumpcrete operation and a fleet of transit mix trucks.

ANSWER: Heltzel engineered batch plant that worked both pumpcrete and transit mix operations with practical perfection and helped Raymond Concrete Pile Company run ahead of schedule.

The installation consists of a basic Heltzel 300-ton, 4-compartment plant (three 70-ton aggregate compartments; one 311-bbl. cement compartment); a 70' high, 250-bbl. per hour bulk cement elevator; a 1000-bbl. bulk cement recirculator with 33' 6" screw conveyor; a 2-cubic yard batcher to charge two tilt mixers—front end charging; special columns and braces to take care of height.

ASK FOR HELTZEL BULLETIN K-37 DESCRIBING PLANTS AND ENGINEERING SERVICE FOR CENTRAL MIX, TRANSIT MIX AND CONCRETE PRODUCTS OPERATIONS.



The Heltzel Steel Form & Iron Company

Construction Equipment Since 1918



WARREN, OHIO

Virginia-Tennessee line. A plant will eventually be built for the new branch, but for the present this operation—Rish's eighth—will operate from its Bristol building.

Rish is also in the process of building a plant 10 miles north of Portsmouth, Ohio, site of the mammoth atomic-energy development. This plant is expected to be completed in the spring of 1953.

Cleco Names Three New Dealers

The Cleco Division of the Reed Roller Bit Co., Houston, Texas, has appointed the following three distributors: Electric Tool & Supply Co., 3000 Santa Fe Ave., Los Angeles, Calif.; Florida Aviation Corp., 4051 N. W. 25th St., Miami 42, Fla.; and Industrial Supplies Co., 324 N. Seventh St., Steubenville, Ohio. The dealers will handle the Cleco and Dallett lines of air tools and accessories.

New Warco Dealer in Pennsylvania

The Hazelton Machinery & Equipment Co., Inc., Hazelton, Pa., has been appointed the Warco motor-grader distributor for W. A. Riddel Co., Bucyrus, Ohio. The firm, headed by F. H. Lubrecht, will sell and service the Warco 4D-85 general-duty 85-hp motor grader and the 4D-100 heavy-duty 100-hp grader in the Hazelton, Scranton, and Williamsport, Pa., area.

Rosco Names Mississippi Dealer

Rosco Mfg. Co., Minneapolis, Minn., has appointed Jackson Road Equipment Co., 842 S. Commerce, Jackson, Miss., to handle its line of bituminous distributors, blacktop maintenance equipment, road brooms, and street flushers. Four men will cover the territory out of Jackson.

Three Distributors for A-C

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named three new distributors for its General Machinery Division. They are as follows:

Dyer-Clark Co., Lawrence, Mass., will handle the company's motors, controls, pumps, transformers, and Texrope-drive equipment in New Hampshire; three northeastern Massachusetts counties; three counties in southern Vermont; and the counties of Cumberland and York, Maine.

Electric Supply Corp., 701 W. Jackson Blvd., Chicago, Ill., and 4511 Calumet Ave. Hammond, Ind., will distribute A-C transformers—the Chicago con-

cern serving eight counties in north-eastern Illinois, and the Hammond firm covering Lake and Porter counties in Indiana.

The third appointee, Rubber Products Corp., 3146 Locust St., St. Louis, Mo., will handle Texrope-drive equipment. This company's territory covers eastern Missouri and southern Illinois.

Lightweight X-Ray

Checks Welded Seams

A new midget-type industrial 250,000-volt X-ray machine for testing critical welded seams is announced by General Electric Co., 4855 Electric Ave., Milwaukee 1, Wis. Less than half the size and less than one-eighth the weight of the conventional 250,000-volt unit, it is capable of X-raying steel up to 3½ inches thick. The lightweight unit can be easily carried around in welding shops, building projects, and on many other jobs where X-ray inspections are needed to control quality and safety.



The new G-E Resotron 250 midget X-ray unit used to inspect a boiler weld.

Under 15 inches in diameter and 44 inches long, it weighs 150 pounds. One of the features is the protruding "snout" from which the X-rays are emitted, which makes possible the taking of "inside-out" X-ray pictures. This, according to G-E engineers, will greatly speed up the process and reduce problems now faced in making X-rays.

In setting up the machine for the inspection of a weld joint connecting two sections of a pipe, for example, the technician can bring the X-ray unit inside the pipe and change its position

for each exposure area without disturbing the pipe. He can also use it inside large castings and other areas difficult of access, or insert the snout inside a smaller casting.

Operating at anywhere from 75,000 to 250,000 volts, the new unit can be used on anything from magnesium to steel. Use of the machine on light metals is also aided by the beryllium

"window" of the X-ray tube, which allows the escape of softer less penetrating X-rays from the tube.

Further information may be secured from the company in Milwaukee or at district offices in all major cities. Or use the Request Card at page 18. Circle No. 140.

Remember—Safety is No Accident!

POWER PLANTS SPEED CONSTRUCTION

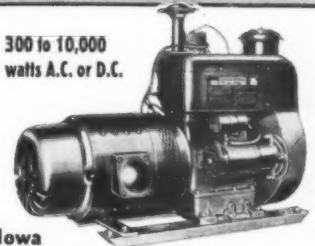
Use Power Tools—Flood Lights

Winpower Portable Electric Plants provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools. Winpower Nite-Hawk units give power plus built-in floodlights. Every contractor should use these high efficiency, quality built plants.

WRITE FOR LITERATURE AND PRICES

WINPOWER MFG. CO., Newton, Iowa

300 to 10,000
watts A.C. or D.C.



Most For Your Money



PIPE & BOLT THREADING MACHINE



Built like a
fine machine tool

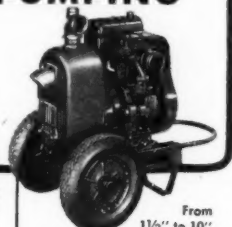
Full of typical RIDGID Improvements

- Range ¼" to 2" pipe; ¼" to 2" bolts.
- Cutting, threading and reaming tools operate independently and right up to chuck, swing up out of way when not in use.
- New RIDGID quick-opening quadritype, dualtype and monotype die heads save time and work.
- Concealed oil system, reversible pump, no priming.
- More than 20 other efficiency improvements—see this remarkable new RIDGID "500" at your Supply House!

THE RIDGE TOOL CO. • ELYRIA, OHIO



STERLING NO-CLOG PUMPING SAVES YOUR PROFITS!



For over 25 years, Sterling SRD* Self Priming Centrifugals have proved themselves the MOST DEPENDABLE PUMPS MONEY CAN BUY!

They are heavy duty, rugged pumps. They WON'T STOP as long as they have fuel—WON'T CLOG—so water won't accumulate to ruin forms or cause costly damage—you save your profits!

Sterling SRD* Pumps operate continuously all day, all night, under conditions that would certainly clog and stop many other types of self priming units!

From
1½" to 10"

4000 GPH to 200,000 GPH

NO-LEAK DOUBLE
GREASE SEAL
LONG DISCHARGE
PUMP VOLUME
POSITIVE
RECIRCULATION
CUT-OFF VALVE
NO-CLOG TRASH
HANDLING IMPELLER
easily adjusted, no
wear plates needed!

plus many more
important advantages

STERLING
MACHINERY COMPANY
1950 Santa Fe Ave., Los Angeles 21



*S—SIMPLE
R—RUGGED
D—DEPENDABLE

SEE YOUR STERLING DEALER OR WRITE TODAY FOR CATALOG

A New Tilt Trailer Features Broad Deck

A wide over-the-wheels platform is the feature of a new tilt trailer offered by Jahn Trailer Division, Pressed Steel Car Co., Inc., 6 N. Michigan Ave., Chicago 2, Ill. The Model JTO is built in five sizes to carry loads of 10, 12, 14, 15, and 20 tons. Wider blades and wider crawlers on new-type tractors and bulldozers are said to have plenty of room on the broad deck of this trailer.

The company reports that the new trailer is suited for the transportation of rollers of approximately 12-ton capacity. The company recommends the use of either air or electric brakes, but the Model JTO is also offered with vacuum brakes or no brakes. Completely automatic double-acting hydraulic rams for cushioning the load are optional.

Features cited by the company include sturdy construction, minimum incline, easy loading, positive platform lock, low platform, rubber-mounted



Jahn's Model JTO tilt trailer—in five sizes to carry loads of 10, 12, 14, 15, and 20 tons—is available with air, electric, or vacuum brakes, or no brakes.

drawbar, and one-man operation.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 200.

FOR LONGER-LASTING RESULTS
QUICKLY ACHIEVED...
Repoint
WORN SHOVEL and DIPPER TEETH

with . . .

MANGANAL

U.S. Patents 1,876,738 - 1,947,167 - 2,021,945

11%—13½% MANGANESE-NICKEL STEEL

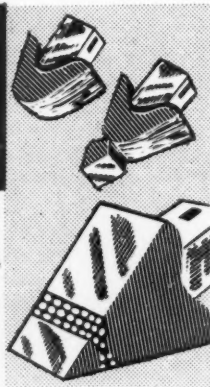
WEDGE BARS

LASTING RESULTS—Manganal Wedge Bars are made of the toughest metal known . . . work-hardens to 550 Brinell . . . minimizes impact and abrasive wear . . . outlast new teeth.

QUICKLY ACHIEVED—Worn teeth repointed with Manganal Wedge Bars almost eliminate build-up time.

STULZ-SICKLES CO.

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.



INEXPENSIVE—Longer-lasting results combined with speed of application make Manganal Wedge Bars your best buy.

FREE

Literature on latest methods for speedy and economical repair of worn equipment.

NEAREST DISTRIBUTOR
UPON REQUEST

PERMITE
CONCRETE CURING COMPOUNDS

widely used on
important projects

because...

they meet or exceed the specifications of most States and Counties, the Corps of Engineers, U.S. Army, the Department of the Navy, and other Federal Agencies. On airfields, flood walls, highways, and other great engineering projects all over the Nation, Permite proves its superiority.

PERMITE

CONCRETE
CURING
COMPOUND

ALUMINUM INDUSTRIES, Inc.
Cincinnati 25, Ohio

- ✓ IN COVERAGE
- ✓ IN PROPER CURING
- ✓ IN LOW COST

Permite Concrete Curing Compound is supplied in three different types to meet the special requirements of all jobs. Write for catalog data and name of nearest distributor.

• DISTRIBUTORS IN MAJOR CITIES FOR
QUICK SERVICE.

A Few Good Distributor Territories Open

Thermosetting Pipe

A new glass-fiber-reinforced thermosetting plastic pipe for pressure transmission has been developed by the Reflin Co., P. O. Box 452, Gardena, Calif.



It is resistant to most salts, acids, hydrocarbons, and natural corrosive elements. It is said to withstand ageing or weathering in above or below-ground conditions. The smooth wall surfaces discourage attachment of mineral and biological deposits, the company says. The coefficient of flow is said to be high. Reflin pipe is unaffected by electrolytic corrosion. The operating temperature range is from minus 90 degrees to 230 degrees F.

The company claims that the high impact strength, light weight, and rigidity of the pipe allows installations to be made quickly and easily. Using standard fittings and simple tools the pipe, with completely leakproof joints, can be laid by two men under average terrain conditions. Connections are made by sleeve-type couplers, Resin-Wrap joints, quick couplers, etc. Reflin pipe is adaptable to all standard auxiliary equipment including valves, pumps, and tanks.

Standard sizes are 4, 6, 8, and 10-inch OD, in 20-foot lengths. Working pressure of the pipe is 200 psi and burst pressure is 1,000 psi.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 104.

A Steel Door Frame

A new knockdown steel door frame that can be handled and assembled by one man is announced by the American Welding & Manufacturing Co., Warren, Ohio.

The frames are made of 18-gage steel. They have two 3-knuckle leaves of 3½ x 3½-inch hinge welded in place. They are also equipped with two knuckle leaves of hinges and hinge pins, two rubber bumpers, welded-in plaster guard, and screws for strike side of jamb. Strike plates are furnished, except for frames to be used with Schlage locks. Frames are supplied with anchors for use in stud or masonry walls.

Designed with mitered corners, the new frames have no unusual vertical or horizontal joints, do not require open corners to fasten the assembly together, and need no screws in header-to-jamb or spreader-to-jamb assemblies. Snap-on steel spreaders, supplied with each frame to maintain frame alignment dur-

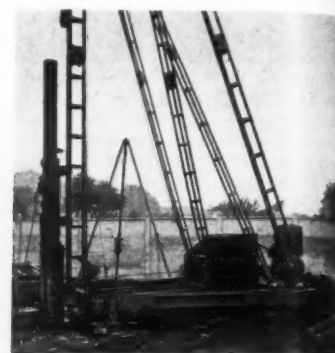
ing erection are said to be easily and quickly removed.

A hammer is the only tool required for the erection of the new interlocking 1½-inch frames, which are available for jamb thicknesses of 4¼, 5¼, and 6¼ inches in door widths of 2 feet, 2 feet 4 inches, 2 feet 8 inches, and 3 feet.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 102.

Diesel Pile Hammer

A new self-contained diesel pile-driving hammer is being placed on the market by the MTP Company of America, 14031 Huston St., Sherman Oaks, Calif. The hammer's chief advantages are the elimination of a steam or air-generating unit, its labor-saving features, high mobility, reduced setting-up time, fuel economy, and low initial cost.



Due to the hammer's compact arrangement, a pile-driving crew may be reduced to an operator and one helper, thus saving about 50 per cent in labor. Its shock-free characteristic permits lightweight tubular leads to be used, which may be mounted on a tractor, crane, or barge, with resulting quick movement to job sites.

The initial model, which is of medium capacity, is particularly suited to average and small jobs, such as the construction of boat landings, piers, docks, revetments, foundations for buildings, and railroad and highway maintenance work. Wood, concrete, and steel piles and sheet piling can be driven to a 150-ton load-bearing capacity at a rate up to 2 feet per minute. The hammer delivers 7,500 foot-pounds per stroke at 60 strokes per minute. The gross weight is 2,250 pounds with a piston weight of 1,150 pounds. The diesel-fuel consumption is ¾ gallon per hour with a tank capacity of 2½ gallons. Over-all dimensions are 14 inches in diameter x 9 feet 10 inches long.

The operation of the hammer is started after the pile is lifted to a driving position and secured to the leads. With the driving anvil and the body of the hammer resting on the pile the heavy ram-shaped piston is raised to its starting position by a line from a small hoist. When the piston reaches its upward position the cocking mechanism is disengaged. During its downward travel a fuel-injection pump cam is actuated, thus injecting fuel into the lower combustion chamber. As the piston nears the lower part of the cylinder the exhaust ports are closed off and compression is started. When the piston strikes the driving anvil, atomization of the fuel under a pressure of over 500 psi is accomplished. The ensuing slow combustion of the diesel fuel adds to the driving forces on the pile as well as returning the piston to its upward position in order that it may continue its next stroke. The over-all driving force exerted on the pile is derived from the pre-combustion pressure load, the piston striking the anvil, and the ensuing explosion of the fuel.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 123.

Heavy-Duty Dragline

A new 8-cubic-yard dragline has been developed by Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. The Model 1855 has four separate Magnetorque units which control all its operations including digging, hoisting, swinging, and propelling movements. The electro-magnetic controls eliminate friction clutches entirely. With magnetic pull instead of mechanical friction, Magnetorque units are said to transmit power without any mechanical linkage or wear.

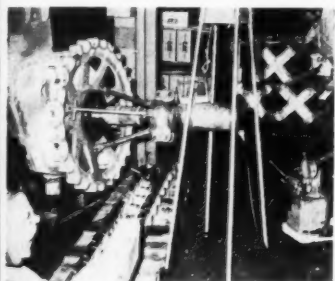
The dragline weighs 600,000 pounds and can handle an 8-cubic-yard bucket with a 120-foot boom or a 7-cubic-yard bucket with a 150-foot boom. It is powered by an 8-cylinder Cooper-Bessemer FV8 diesel engine which develops 590 hp at 900 rpm. Maximum height of the new model is 32 feet, with the cab top slightly more than 19½ feet above the ground. Distance from the ground to the bottom of the counterweight is almost 5½ feet.

The 1855 develops 16.2-psi ground pressure. Over-all width of its crawlers, with 60-inch shoes, is 22½ feet while the crawler length is 29 feet. The dragline has a 246-fpm hoist-line speed and a 199-fpm digging-line speed. The hoist-line pull is 75,600 pounds and the digging-line pull is 93,500 pounds. Traveling speed of the new unit is 0.5 mph while its rotating speed reaches 3.54 rpm.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 128.

Tractor-Service Jack

A portable tractor-service jack for removing or assembling sprockets, brackets, gears, shafts, and pins is announced by Rodgers Hydraulic, Inc., 7415 Walker St., St. Louis Park, Minneapolis 16, Minn.



The unit consists of a hand-operated hydraulic pump and cylinder with service-tool head. It is suspended from a pedestal containing a hand-operated hoisting mechanism for quickly positioning the cylinder to the work. The jack develops 100 tons pressure for pressing, jacking, straightening, and assembling, and a maximum pull-back pressure of 80 tons.

Power is supplied by a 3-speed hydraulic hand pump. A manually operated shifting lever located on top of the pump permits the change from very rapid approach speed to an intermediate working speed or a high-pressure working speed.

Further information may be secured from the company by requesting Catalog No. 321. Or use the Request Card at page 18. Circle No. 132.

Emulsified-Asphalt Data

A 24-page brochure on the use of emulsified asphalt in maintenance work has been released by American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 4, Calif. Emulsified asphalt bonds to macadam, gravel, all bitumized surfaces, cement concrete, granite blocks, bricks, or cobbles.

The brochure includes on-the-job illustrations. It points out that emulsified asphalt lengthens the construction season because showers and cooler weather do not seriously interfere with its



The Model 1855 dragline underwent recent field tests at Harnischfeger's Milwaukee plant. Contractors inspect the machine after the tests.

installation. Expense of idle workers and equipment is eliminated.

Included in the brochure are sections on the modern way to use asphalt (characteristics, types, and suitability

of bitumuls); bitumuls surface treatments for maintenance (importance of proper sealing, etc.); and bitumuls penetration macadam for maintenance.

This literature may be obtained from

the company, or by using the Request Card at page 18. Circle No. 116.

Le Roi Sales Promotions

N. M. Sedgwick, former Sales Manager of the Construction and Mining Division of Le Roi Co., Milwaukee, Wis., has been named General Sales Manager of the Division. He has been with the company since 1928.

Further appointments are: R. H. Rodolf, Special Representative since 1950, takes the post of Manager of Rock Drill Sales; C. L. Meigs, former Sales Correspondent for the Compressor Department, is Assistant General Sales Manager of the Construction and Mining Division; and William D. Lund, who was Sales Engineer of the Division, now becomes Assistant to Mr. Sedgwick.

The promotions are a move to meet the expanded sales program in the company's Construction and Mining Division caused by the rapid growth of Le Roi's Cleveland Rock Drill Division.

GOODALL BELTING

*Built to Do the Big
Jobs Better!*



"SUPER TRIPLE-S" CONVEYOR BELTING.

Goodall's finest, with a reputation for strength, durability and economy on all jobs involving severe service. Particularly suited to long center hauls where tension is high and extreme flexibility required. For aggregates, crushed limestone up to 10", run-o'-mine coal, ores, slag, etc.—wet or dry. Made with a heavy duck carcass, high-tensile rubber covers and strong friction between plies, in widths up to 48".

"TRIPLE-S" CONVEYOR BELTING.

Same superior quality as above, and generally for the same service, but of somewhat lighter construction.

"GOODALL" CONVEYOR BELTING.

The right belt for crushed stone, gravel, shells, sized coal, etc.

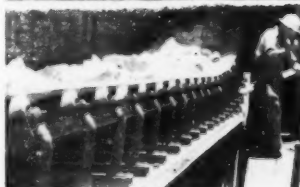
"WEAR KING" MUCKER BELTS.

Developed especially for use on Conway Mucking Shovels in tunnel excavating, and built to give maximum service under the severe conditions involved. Assures highest resistance to continuous tension, terrific load impact, small-pulley flexing and ply separation.

"76" GRADER BELTING.

Built to uphold its reputation for long, reliable service on heavy-duty elevator road graders, where delays for belt repairs generally mean serious loss of time and money.

Contact Our Nearest Branch for Details and Prices of These and Other Goodall Belting Brands.



GOODALL RUBBER COMPANY

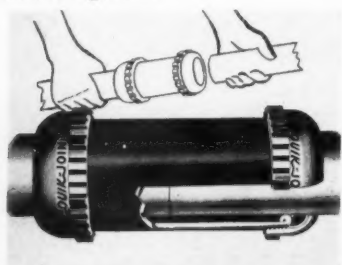
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • Detroit • St. Paul • Los Angeles • San Francisco • Seattle • Portland • Salt Lake City • Denver • Houston • Distributors in Other Principal Cities

Est. 1870

New Pipe Coupling

A new factory-assembled pipe coupling which can be quickly installed in any piping system is announced by Quik-Joint Mfg. Co., 469 E. 159 St., Harvey, Ill. No thread cutting is required. Pipes to be connected are inserted into the ends of the coupling body and the lock nuts wrenched to desired tightness.



The result is a tightly sealed but flexible joint capable of withstanding working pressures up to 2,000 psi, the

company reports. No castings are used; the body is of pressure-tested pipe steel having a greater wall thickness than the pipe to be joined. Lock nuts and gasket retainers are drawn from cold-rolled steel. The compression rubber gasket comes in a number of types.

Quik-Joint can be used for gas, water, air, and oil lines. It is available in sizes from 1/2 to 1 1/2 inches as straight coupling, 90 and 45-degree L's, welded and threaded adapters. Special lengths and bends to specification are also available.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 143.

Huber Is ASCE's President

Walter L. Huber of San Francisco, Calif., is the President of the American Society of Civil Engineers for the coming year. He has had a distinguished career of engineering important hydraulic and structural projects and has served as Vice President and Director of the Society and President of its San Francisco section. He succeeds Col. Carlton S. Proctor.

The new Vice Presidents, named for two years, are: Edmund Friedman of Coral Gables, Fla., for Zone II; and G. Brooks Earnest, President of Fenn College, Cleveland, Ohio, for Zone III. Eight new District Directors were elected for three years.

At the annual meeting of the Society in New York last October, officers were inducted, and the Metropolitan Section held a dinner meeting. Speakers were: Mr. Huber, William L. Hanavan, President of the Metropolitan Section, and Dr. Henry T. Heald, Chancellor of New York University and Chairman of the Convocation Committee for the ASCE centennial celebration this year.



The Model 15 Speedall front-end loader has a static load capacity of 3 tons.

Front-End Loader

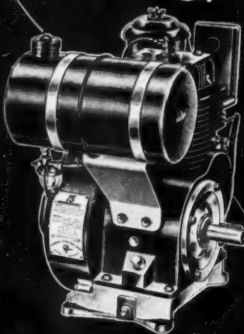
A new 1 1/2-yard front-end loader with 4-wheel drive is offered by Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill. The Model 15 Speedall is powered by either a 100-hp gasoline or a 73-hp diesel engine. It has 4 forward and 4 reverse gears and can travel from 2 to 24 mph.

The 7-foot-wide bucket has a static load capacity of 3 tons. Standard equipment includes adjustable seat, hydraulic booster steering, and booster-type brake control.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 108.

when you
need top
performance

Power



make dependable
GLADDEN ENGINES
your choice

3 POWER PLANTS
4 HP • 5 HP • 7 HP

Gladden engines' capacity for round the clock rugged work makes it the preferred engine by today's contractors. Work records kept on the service line of these engines shows substantial savings in power costs. Good service with little maintenance cost is the cry of small and large contractors when selecting power.

GLADDEN OPENS KANSAS CITY SALES AND SERVICE PLANT

10 WEST 19TH STREET, KANSAS CITY 8, MO

This new Kansas City outlet means faster delivery and quicker service. This is another step in Gladden's network of distributors throughout the world to offer you the finest in sales and service on Gladden engines.

REMEMBER, BUY POWER PLUS

... BUY GLADDEN ENGINES

For further information write



**GLADDEN PRODUCTS
CORPORATION**

Now In the 33rd Year of Engine Building

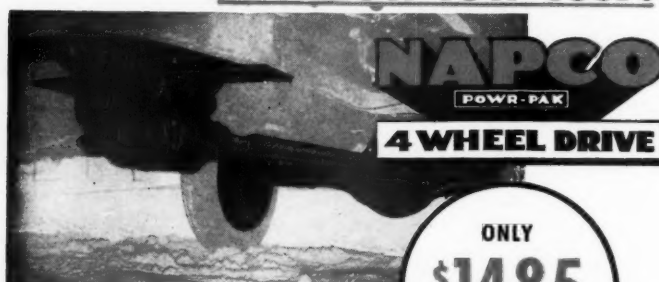
835, Dept. 100, West Colorado, Glendale 4, California

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PROVEN!

4 WHEEL
DRIVE

WITH 2-SPEED RANGE FOR
CHEVROLET and GMC TRUCKS

at a new low cost!



4 WHEEL DRIVE

ONLY

\$1485

F.O.B.
MINNEAPOLIS

**NO OTHER 4 WHEEL DRIVE
COMPARES WITH NAPCO'S
Powr-Pak . . . absolutely the
FINEST FOR PERFORMANCE,
DURABILITY and COST!**

The NAPCO 4 Wheel Drive is by far the lowest priced in the field. What's more, you get a better, more powerful unit that is outstanding for rugged construction and unexcelled for lasting performance. It is the same military-type 4 wheel drive chosen by the U. S. Armed Forces during World War II on the hundreds of thousands of Chevrolet and GMC trucks used throughout the world.

Installation is simple, can easily be completed in one day! All front axle differential parts are the same as the standard rear axle.

Write today for free, illustrated folder giving complete details and specifications on this completely proven NAPCO 4 WHEEL DRIVE



NORTHWESTERN AUTO PARTS CO.

834 NORTH GILBERT ST., MINNEAPOLIS, MINN. 55405

- **OVER ROUGH TERRAIN**
Extra dependable traction with NAPCO 4 WHEEL DRIVE takes your truck through almost impossible areas in less time, and with minimum maneuvering.
- **FOR TOUGH UPHILL GOING**
No ordinary 4 wheel drive can match the NAPCO Powr-Pak on gradeability—in low-low, your truck will climb grades up to 70 per cent!
- **MASTERS MUD AND SAND**
NAPCO 4 WHEEL DRIVE assures plenty of traction to enable your truck to go through mud and sand easily where other trucks stop dead in their tracks.
- **OVER ICE AND SNOW**
Sure footing, greater safety and plenty of push on the slickest roads are wrapped into one unbeatable package—the NAPCO 4 WHEEL DRIVE!

**watch 'em
take it!**



**HIGH CARBON
STEEL TUBING
DOES THE TRICK!**

**Safway
Steel Scaffolds
ENGINEERED TO
LAST!**

Portable steel scaffolding can offer real advantages—as long as the equipment stands up. That's why Safway Scaffolding is the No. 1 choice!

Safway interchangeable parts can take it... through countless jobs, and seasons, and years... without requiring repairs or replacement. Here are specific reasons why:

High Carbon Structural Steel Tubing easily supports heavy loads and strains.

Unequaled Safway Engineered Design approved by Underwriters' Laboratories, Inc. **Master Welders**... exclusively... produce safe, strong, lifetime welds on Safway parts. **Rust Inhibiting Treatment** maintains precision fit of component parts to permit re-use indefinitely.

Baked Enamel Finish on all surfaces, inside and out, for fine appearance and long, safe life.

Get the full story! Learn how you can profit by using Safway's complete line of construction accessories.

Write for this Free Bulletin

**RENTED and SOLD
by distributors everywhere**



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STEEL PRODUCTS, Inc.**
6240 West State St.
MILWAUKEE 13, WISCONSIN

Tubular Steel Scaffolding and Equipment



It's a Master—paving a concrete apron at Burlington, Vt., Municipal Airport. A Master vibratory concrete finishing screed is pulled over the surface of a 12½-foot lane. Picture with story in our October issue, page 12, was incorrectly captioned.

Steam-Cleaning Unit

Development of a heavy-duty and high-capacity steam cleaner is announced by the Clayton Mfg. Co., P. O. Box 550, El Monte, Calif.

The BOE-600S discharges up to 600 gph of pressure detergent spray and up to 600 gph of hot or cold pressure rinse simultaneously. Equipped with a

loads, while the pressure-atomizing burner system, equipped with safety switch control, operates on common low-cost fuels such as kerosene, fuel oil, distillates, or gasoline. An accurate detergent-metering device maintains the detergent-water ratio at the level found most effective for rapid thorough cleaning.

Control handles, pressure gages, and inlet and outlet connections are arranged for convenient use and easy access. Two hinged hoods provide quick access to working parts for minor adjustments.

The machine comes complete with a specially insulated cleaning gun, a rinse gun, two sets of delivery hoses, and 150 feet of heavy-duty electrical cable. The equipment operates on 220-volt, 60-cycle, three-phase current. It is 48 inches high, 88 inches long, and 34 inches wide. Weight, with storage tanks empty, is 2,000 pounds.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 158.



60-gallon detergent-concentrate tank and a 40-gallon fuel tank, the new unit will operate without replenishment for 4 hours continuously at maximum load, and for many additional hours at lesser loads.

The vapor generator operates in excess of 80 per cent under all operating

Public Works Dept. Opens Truck-Weighing Stations

The New York State Department of Public Works has opened 20 truck-weighing stations throughout the state. These stations are operated by nine-man working crews on a schedule that

permits round-the-clock operation, seven days a week. They have been constructed with approach drives designed to facilitate the weighing of trucks and create the minimum of disturbance to highway traffic.

The Department is charged with the operation and maintenance of these

stations for the Truck Mileage Tax Bureau of the State Department of Taxation and Finance. Operation of the stations is in conformity with the Truck Mileage Tax Law, under which vehicles having a maximum gross weight in excess of 9 tons will pay varying rates per mile of travel on the highways.

4-Cycle Air-Cooled

KOHLER ENGINES



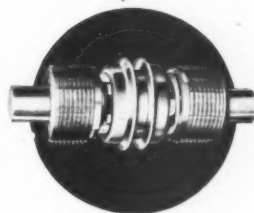
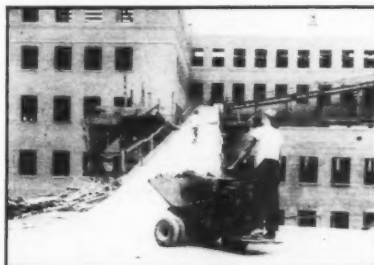
Kohler Engines provide reliable power for a wide range of uses. Compact, quick-starting. Engineered and built to the high standards that have won world-wide acceptance for Kohler Electric Plants in construction and other industries. The Kohler mark has been identified with quality products for over three-quarters of a century. Write for information on distributor's sales franchise.

Kohler Co., Kohler, Wisconsin. Established 1873

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

No Push—No Pull—Just Ride



This Motorized Wheelbarrow

The forward and reverse, controlled dump, and direct steering features of Koehring Company's MOTO-BUG take the hard work and high cost out of material handling for construction and industry. ROCKFORD CLUTCHES contribute to the versatility of this handy unit. Let ROCKFORD clutch engineers help plan efficient power transmission controls for your machines.

ROCKFORD CLUTCH DIVISION
314 Catherine Street, Rockford, Illinois, U.S.A.

ROCKFORD CLUTCHES

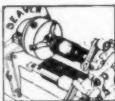
THE NEW BEAVER "55" UNIVERSAL NIPPLE CHUCK

Simple! Easy! Best for Use With Pipe Machines, Power Drives or Bench Vises!



● The last word in simplicity! Only 3 parts—polished steel body, sliding plunger and a hardened steel threaded shank. Adapters for ½ up to 1½" pipe—no adapter needed for 2" pipe. Inserted pin holds sliding plunger in working position. All parts polished and rust-proofed. Packed in a compact, heavy-gauge sheet-metal kit box—can be bought without kit box if desired. Pays for itself by converting short pipe lengths into useful all-thread, close-thread or average nipples. Order today from your regular supply house. Immediate delivery!

BEAVER
PIPE TOOLS
258-300 DANA AVE. • WARREN, OHIO



Threads ½ to 2" Pipe! Finger-tip Control! Nipples Easily Removed! No Wrenches Required!



FOR ANY PIPE MACHINE WITH POWER DRIVE—CUTS ANY SIZE NIPPLE



USE WITH ANY PIPE VISE



USE WITH ANY MACHINIST'S VISE



B-W ENGINEERING MAKES IT WORK
B-W PRODUCTION MAKES IT AVAILABLE



ENGINEERING BULLETIN SENT ON REQUEST



The LoDal can be changed from truck to truck, and its bucket lifts up to 3,000 pounds.

Truck Self-Loader

A front-end loading attachment for trucks is manufactured by Brisson Bros. Machinery Co., Norway, Mich. The LoDal can be changed from truck to truck and will do light digging, scooping, grading, or stockpiling.

The unit's 1 1/4-yard bucket will lift up to 3,000 pounds. Buckets are available in 54 and 60-inch widths.

A single-cab lever controls both up and down movement. No separate loader chassis or engine is needed. The company claims that the LoDal will load a yard per minute of heavy material and 3 yards per minute of light material.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 201.

WASHO Road Test Has Begun

A nation-wide attempt has been made by highway engineers and the highway transportation industry to develop factual information upon which to base design of highways for heavy truckloads, to guide legislators attempting to draw equitable tax laws for highway users, and to help truck manufacturers and operators to determine reasonable and efficient vehicle-operating sizes and weights. One of the

most recent efforts, known as the WASHO Road Test, has begun with the completion of the test road south of Malad, Idaho. (See C. & E. M., Sept., 1952, pg. 10.)

The test is sponsored by eleven western state highway departments, with the cooperation of the Bureau of Public Roads, the Automobile Manufacturers' Association, the Truck Trailer Manufacturers' Association, and others. The highway Research Board, Washington, D. C., is administering the project and conducting the research studies.

The regular test, consisting of 18 hours of truck traffic per day over the test sections, six days a week, was begun last month, and according to present plans will be discontinued this winter and resumed next spring or early summer. By fall of 1953, with the completion of the principal program of tests, each test section will have been subjected to over 200,000 heavy axle loads.

Folder on Motor Grader

A 4-page folder on the No. 512 motor grader has been issued by J. D. Adams Mfg. Co., P. O. Box 853, Indianapolis, Ind. The heavy-duty unit features an 85-hp diesel engine, rubber-mounted to eliminate vibration.

The folder points out that the motor

grader has a wide range of blade positions without mechanical adjustments. There are ample blade clearances. The No. 512 has eight forward speeds with a 24.8-mph transport speed.

The folder illustrates and describes optional equipment. It lists complete specifications for the motor grader and engine.

This literature may be obtained from the company, or by using the Request Card at page 18. Circle No. 202.

New Portable Tool Bends and Shears Rod

A new portable tool for bending and shearing 3/8, 1/2, and 5/8-inch reinforcing steel rod is distributed by Lee Sales Co., 8439 Gainford, Downey, Calif. The Bend-O-Shear can bend the rod to many angles, including 2 and 3-inch hooks, and with it one man can cut or bend 5/8-inch steel rod with one hand, the company reports.

The shears are constructed with Tor-



rington bearings and one blade cuts rods of all sizes up to 5/8 inch. The Bend-O-Shear weighs 24 pounds and mounts over the end of a bench or plank.

Further information may be secured from the company. Or use the Request Card at page 18. Circle No. 130.

TRADING POST

CLASSIFIED ADVERTISING

An advertising inch in the Trading Post is measured 7/8-inch vertically on one column. Space reservations close in the New York office on the 10th of the month preceding publication. Send your classified copy to:

The Trading Post, Contractors & Engineers Monthly
470 Fourth Avenue, New York 16, N. Y.

IMMEDIATE DELIVERY

- 1—Allis-Chalmers Model B tractor with mower.
- 1—Bros Model SG-55 skid mounted steam generator.
- 1—Galion Motor Patrol. Model 102—tandem drive.
- 1—Novo traffic line marker.
- 1—Allis-Chalmers Model HD 19. Recently overhauled, equipped with Baker hydraulic angle dozer.

ILLINOIS ROAD EQUIPMENT CO.

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All instruction by mail. Send today for sample lesson and complete details

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STOCKS — ATLANTIC — PACIFIC & GULF PORTS
4400 PCS. CARNEGIE WP-101 STRAIGHT WEB & TEES
16 to 70 FT. STATE OF WASHINGTON.
536 PCS. Z-32 — 40 & 50 FT. N.Y. & FLA.
670 PCS. DP2 — 28 - 40 - 45 & 60 FT. N.Y. & FLA.
468 PCS. Z-27 — 40 FT. N.Y.

ALL SECTIONS BOUGHT — SOLD — RENTED
STANHOPE, 60 E. 42nd ST., N.Y. 17, N.Y.

DECALS

SAVE 25% ON YOUR DECALS
••• 10 DAY DELIVERY •••

FOR PRICES SEND ROUGH PENCIL SKETCH
OF DECAL YOU ARE NOW USING

MIRACLE DECAL CO.

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Mechanic Wanted

Caterpillar mechanic wanted by Equipment Distributor in Iowa. Permanent shop. Year 'round job. Pay according to ability.

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NEW OR FACTORY REBUILT
FOR SALE ••• FOR RENT
327 N. BELL AVE., CHICAGO, ILL.

GIGANTIC WAR SURPLUS EQUIPMENT SALE

Savings on 70%. Engines, A-C generators, welders, winches, small air compressors, water pumps, electric and gas chain saws, binoculars, many other items. Write for wholesale industrial catalog.

BURDEN SALES COMPANY
931-C "O" St., Lincoln, Nebr.

STOP that WATER

With FORMULA NO. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—held 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

WANTED TO BUY OR RENT

1 1/2-cu. Yd. Dragline
Must be good.

Ideker Construction Co.

Dirt Moving Contractors

Mound City, Mo.

WANTED TO BUY

34E Dual Drum Paver, near new, late model.
9" x 9" Road Forms.
Finishing Machines, up to 24'.
Material Bins 60-100T, 3 compartment.
E. T. Simonds Construction Co., Inc.
Box 336 Phone 881K
Carbondale, Illinois

BUY used equipment SELL used equipment ACQUIRE competent personnel

through

The Trading Post Section of
CONTRACTORS &
ENGINEERS MONTHLY

See page 119.

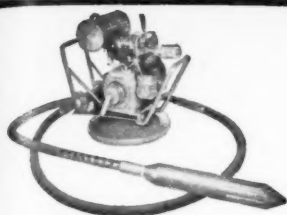
WANTED: A TOP FLIGHT EDITOR

The man we're looking for is well seasoned in trade magazine editing. He's completely dependable and has his feet firmly on the ground. He's a graduate engineer and has worked for a few years, at least, as an industrial or consulting engineer. He has the ability and personality required to organize and supervise an editorial department and is able and willing to be a "working" editor.

If you possess these requirements, we have an opportunity which is sure to interest you. We're expanding our operations to include publication of a new magazine, "Consulting Engineer", and we're looking for a man capable of directing the editorial departments for both "Consulting Engineer" and "Industry and Power", a magazine which we've published for over thirty years. Salary is open and definitely in line with the importance of this job.

When applying, please give us, in your first letter, a complete resume of your education and experience, tell us about your family and home, let us know why you think we should employ you for this position, and give us your salary requirements. If you have a photo or snapshot of yourself, send it along, too.

Please do not telephone or apply in person. We want to study all applications carefully. Your application will be treated in absolute confidence. Our employees know of this advertisement. Direct your application to A. M. Roe, Managing Partner, Industry and Power Publishing Company, 420 Main Street, St. Joseph, Michigan.



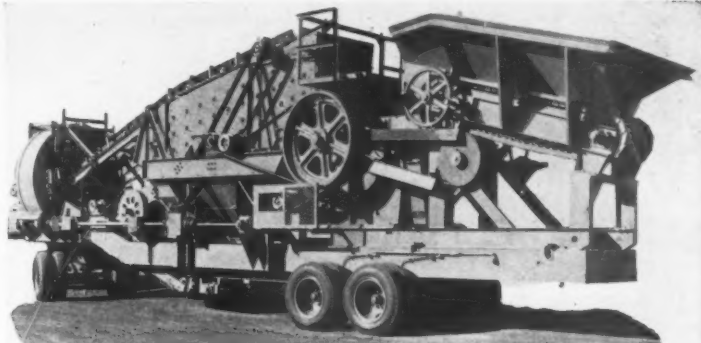
ONLY WHITE VIBRATORS HAVE ALL THESE FEATURES

which have made them successful all over the world.

- All Flexible Drive Sections are interchangeable. No special sections, or expensive extra couplings needed. Each casing has ball bearing connector.
- No Limit to Length of Flexible Drive. Each driving core has slip joint which does not separate in service. Prevents stretching.
- All Vibrator Heads are interchangeable. Can be put directly on any drive section. Can be opened for repairs. Double row ball bearings.
- Grinding Spindles can be attached to any section. No special drive needed. For wet and dry grinding.
- Standard Power Units. Gasoline engines or electric motors which can be serviced almost anywhere. Swivel base. Barrows.
- Minimum of Repair Parts Needed. One spare driving core is ample. Either 7' or 12'.

Write for circular and name of nearest dealer

Elkhart 9 White Mfg. Co. Indiana



Universal Engineering Corp.'s latest addition to its 293QH lime-rock plants.

New Lime-Rock Plant

An addition to its 293QH Series lime-rock plants is announced by Universal Engineering Corp., 625 C Ave., N. W., Cedar Rapids, Iowa. It features an 18 x 30-inch roller-bearing jaw crusher, an 18 x 31-inch hammer mill, and a 4 x 10-foot three-deck gyrating screen with ball tray. Special by-passes are built

in to give product control for producing aglime, road rock, and chips simultaneously; aglime and chips; aglime and road rock; or all aglime.

The primary jaw crusher, apron feeder with by-pass, operator's platform, and structural supports are mounted on skids as a separate unit, which is bolted to the main frame. The complete primary unit is said to be easily removed to cut weight when traveling.

Other features cited by the company include new simplified drives with side drive through universal joint connection from truck-mounted power. Feed is direct from shovel or by dump trucks from ramp setup.

The 293QH lime-rock plants are now available in balanced combinations with 18 x 24, 18 x 30, and 20 x 36-inch jaw crushers; 18 x 31 and 26 x 36-inch hammermills; and 4 x 10 and 4 x 12-foot screens.

Further information may be secured from the company. Or use the Request Card that is bound in at page 18. Circle No. 181.

Flexible-Tubing Catalog

A complete line of flexible tubing, in diameters from less than 1 inch up to 30 inches, is described in a 4-page bulletin available from Flexible Tubing Corp., Guilford, Conn. The ducting, made of fabric-supported rubber or plastic wound on helical-spring wire coils, is said to be lightweight, highly retractable, and noncollapsible. It does not kink, it is flexible enough for 180-degree turns, and it requires no installation skill, the company claims. The tubing may be used for portable and semipermanent ventilation service, fume removal, dust collection, and materials handling. The catalog also includes information on tubing for special applications, and on fittings.

This literature may be obtained from the Flexible Tubing Corp., by requesting Catalog C2-3, or by using the Request Card that is bound in at page 18. Circle No. 182.



A self-propelled Hydra-Hammer breaks up concrete pavement for trench work on a New Jersey Garden State Parkway job. The hammer drops 30 times a minute. For further information use card at page 18. Circle No. 190.

HEAVY CONSTRUCTION EQUIPMENT—FOR SALE

Located at Site of Downsville Dam, Downsville, New York
(Contract 401—Board of Water Supply of the City of New York)

Certain groups available immediately; others within next 3-4 months

HAULING EQUIPMENT

- 96—Euclid Bottom-Dump Tractor-Wagon Units. Models 43FDT, 38FDT, 67FDT, 71FDT. All with G.M.C. 671 engines. All with Mod. 58W 13 Cu.Yd. Wagon units.
- 9—Euclid Model 8TD Rear Dump Units—16.8 Cu.Yd. capacity—56Y Body with side extension. All with Cummins 27575P Engines.
- 7—Euclid Model 49FD Rear Dump Units—12 Cu.Yd. capacity. All with G.M.C. 671 Engines.
- 3—Euclid Loaders. 1 Model 38V; 2 Model 98V. Also 1 Model 109 W Dolly for 98V Loader.
- 4—LeTourneau Model CIH Scraper Units—13 Cu.Yd.
- 11—Sterling Model HCS 297 Rear Dump Earth-Hauler Units, 16 Cu. Yd. Boulder Dam Bodies, Cummins H8B Diesel Engines. Four are presently mounted with 4,000 gallon steel water tank, catwalk and spraybar.

POWER SHOVELS AND CRANES

- 1—Lima Model 604 Shovel/Crane Combination—1½ Cu.Yd.—90 ft. Boom.
- 3—Bucyrus-Erie Model 54-B Shovels—2½ Cu.Yd.
- 1—Bucyrus-Erie Model 54-B Shovel/Drumline Combination—2½ Cu.Yd.—60 ft. Boom.
- 2—P. & H. Model 1055 Shovels—3 Cu.Yd.
- 1—Lima Model 1201 Shovel/Drumline Combination—3½ Cu.Yd.—100 ft. Boom.
- 1—Lorain Model TL20 Moto-Crane, with Shovel Digger Attachment.
- 1—Northwest Model 25 Combination Shovel/Crane/Drumline/Back-hoc, ¾ Cu.Yd., mounted on Northwest-Dart 10-wheel Carrier.
- 1—Complete Shovel front attachment—for 2 Cu.Yd. Lima Model 802 Shovel.
- 6—Buckets—various types and capacities (Digging, Drag, Clam, Concrete)
- 1—Day-Smith Type 100 Luger Crane.
- 1—Oshkosh Tractor, 4-wheel drive, mounted with Gar Wood US6A Hoist and Crane.

TRACTOR-BULLDOZERS

- 23—Caterpillar Model D8 Tractors with Bulldozer and P.C.U. attachments—Series 8R, 1H, 2U.
- 2—Allis Chalmers Model HD19H Tractors with Bulldozer and P.C.U. attachments.
- 3—International Model TD24 Tractors.
- 1—LeTourneau Model K30 Rooter.
- 6—Rock Rake Attachments for D8 Tractors.

"GRIZZLY" EARTH PROCESSING PLANTS, BATCH PLANT

- 1—Complete "Grizzly" Earth Processing Plant—Designed by Robins Engineers Division to handle 1,350 Cu.Yd. per hour of "A" impervious type material. Complete descriptive details on request.
- 1—Complete "Grizzly" Earth Processing Plant—Designed by Robins Engineers Division to handle 2,600 Cu.Yd. per hour of "B" pervious material. Complete descriptive details on request.
- 1—Robins H.D. Scraping Screen, fitted with H.D. perforated plate and skid rails; 6' square openings; powered by LeRoi Gasoline Engine; electric starter and generator, clutch and stub shaft.
- 1—Butler 200 Cu.Yd. capacity Batching Plant—3 aggregate compartments—55 ft. Elevator; 100 bbl. Cement Bin, 45 ft. Screw; 1200 bbl. Storage Silo.

ROLLERS, HARROWS, GRADERS

- 19—Sheepsfoot and Miscellaneous Rollers, including 5 Southwest TD2-102 Sheepsfoot; 6 McCoy USHD47 Sheepsfoot; 2 McCoy USHD55 Sheepsfoot; 2 Southwest TD3-0 converted to Sheepsfoot; 3 Special C.B. 5' x 6' Smooth Land Rollers; 1 Special C.B. 3-Drum Smooth Roller.
- 4—Rome Model 6MM Heavy Duty Disc Harrows, 6 disc sections, 28" diameter.
- 5—Graders. 1—Allis Chalmers Model AD-3; 4—Caterpillar Model 12.

MISCELLANEOUS

- 4—Worthington Deep-Well Type 12 QG-H2 Turbine Pumps, 1500 GPM capacity at 110' TDH. Nos. 1349448/49 are Electric Motor Driven; Nos. 1349450/51 are Diesel Engine Driven.
- 20—Miscellaneous Pumps—various makes, sizes, and models—capacities 1½" to 6".
- 28—Kohler Light Plants—assorted sizes and models—including Models D, 3A21, 3M21, 3A21, 5L21, E.
- 6—Air Compressors (Ingersoll-Rand, Jaeger, Brunner)—various models and capacities.
- 7—Tampers, gasoline driven:—1 "Barco" Model BR5; 6 "Master" Model G-1.
- 1—Rex Model 160 Double Pumpcrete Machine—Serial CZD107. Also large lot of 7" diameter pipe in straight sections and specials.
- 1—Gardner-Denver Grout Machine Model EF-F5, 10" x 4" x 10", 14 c.f. capacity, with line oiler and agitator.
- 1—30 ft. Unit Steel Tunnel Forms, 13' x 13', non-telescopic, straddle type traveller.
- 1—Lot Blaw-Knox Steel Panel Concrete Forms—about 20 Tons.
- 1—5 ton Chisholm-Moore Overhead Crane and Hoist.
- 1—Lambert Electric Mine Hoist, single drum, 24" Diameter, 20" face, 10" flanges—6,000 lbs. capacity @ 400/450 R.P.M.

Above list covers principal groups of equipment offered. In addition, have large assortment miscellaneous tools and equipment such as air tools, concrete vibrators, power saws, welding machines, shop equipment. Also large inventory of miscellaneous Repair Parts for major equipment groups listed, such as Caterpillar, International and Allis-Chalmers Tractors; Euclid, Sterling, and LeTourneau equipment; General Motors, Cummins and Buda Engines; Bucyrus-Erie, Lima and P. & H. Shovels, etc. Also a wide variety of electrical equipment, transformers, wiring, fixtures, etc.

Address inquiries to:

Peter M. Bianchi, Project Manager

BIANCHI, CENTRAL, MUNROE-LANGSTROTH, RUGO

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Perlite Institute Meeting

At its annual meeting in Minneapolis, Minn., last October, the Perlite Institute elected its new President for the next two years. He is Lewis Lloyd, President of Alatec Construction Service, Inc., New Orleans, La. Mr. Lloyd is also Vice President and Director of the National Concrete Masonry Association and Vice President of the Texas Concrete Masonry Association. The new Vice President of the Perlite Institute is J. C. Kingsbury, Vice President of F. E. Schundler & Co., Inc., Joliet, Ill. Three new members were elected to the Board of Directors.

Meeting discussions centered around Perlite as a plaster and concrete aggregate. Included in the new data released to members by the technical committee on plaster and concrete was a report on the physical properties of Perlite concrete such as compressive and tensile strengths, as well as comprehensive load data for short-span Perlite-concrete roof slabs made with a variety of different mixes.

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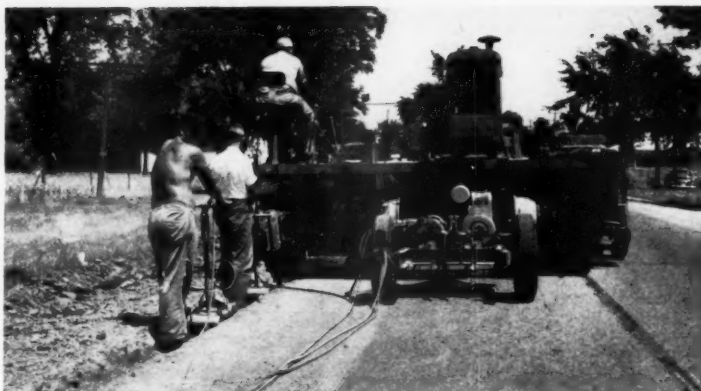
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An Apsco spreader lays gravel and pulls a trailer unit consisting of a Jackson 3.5 KVA portable trailer power plant and two CT-350 vibratory compactors (held by the men on the left) powered through 50 feet of cable.

Quick Road Widening With Electric Tamper

Electric tamping units saved considerable time on a recent road-widening job in Michigan. The Ann Arbor Construction Company had 27 miles of 16-inch-wide x 15-inch-deep trench to excavate and then pave with bituminous concrete.

To do the job they first called on a Cleveland 110-4 trencher with 14-inch buckets. This unit dug 1 to 2 miles per day in hard digging and 3 to 4 miles per day in normal digging.

The trencher was followed by an Apsco spreader laying 7½ inches of gravel and pulling a trailer unit consisting of a Jackson 3.5 KVA portable trailer power plant and two Model CT-350 vibratory compactors powered through 50 feet of cable. The compactors reduced the aggregate to a depth of 6 inches. As a compactor moved ahead at 35 feet per minute, it delivered 1¼-ton blows at the rate of 4,500 per minute. Further, according to the State of Michigan tests, the compaction resulting from the use of these units was 102 per cent density, whereas the requirements are only for 90 per cent.

Next, an Apsco spreader laid three 3-inch layers of bituminous concrete in the trench. Each was compacted by a Buffalo-Springfield three-wheel trench roller with a 46-inch diameter and 16-inch-wide compression roll.

Finally, 1¼ inches of base course bituminous concrete was spread and rolled, followed by a 1-inch surface course

of the same, laid by a spreader then rolled by two 12-ton rollers.

New Company to Make Tensioning Units for Prestressed Concrete

Production of the only large-diameter high-strength steel tensioning units for the prestressing of concrete is the aim of a recently formed company—Stressteel Corp., 207 E. 37th St., New York 16, N. Y. The company has put out a 64-page comprehensive illustrated handbook—"Stressteel Manual"—describing the new material and its use.

Donovan H. Lee, a London consulting engineer, and McCall's Macalloy, Ltd., of Sheffield, England, developed the tensioning units, which consist of bars ½ to 1½ inches in diameter and up to 80 feet in length, together with their end anchorages. A group of American and Canadian businessmen established Stressteel Corp. to manufacture and sell the units in North America and in Cuba, the Philippine Republic, and the territories of the United States, under license from the proprietors of the Lee-McCall system. President of the Stressteel Corp. is Curzon Dobell, New York; Gerald Bronfman, Montreal, is Vice President; and Edward Schechter, New York, is Treasurer.

Negotiations for a manufacturing plant in Pennsylvania are now nearing completion. In the meantime, this new material is immediately available to

the American construction industry by import from England at the same prices as will prevail when domestic production starts.

Further information on Stressteel tensioning units, or a copy of "Stressteel Manual", may be obtained by writing to the company. Or use the Request Card at page 18. Circle No. 109.

Midwest Factory for Marlow

A complete branch factory located in De Queen, Ark., has been put into operation by Marlow Pumps, Ridgewood, N. J., manufacturer of centrifugal pumps. The 16,000-square-foot plant, in addition to manufacturing and assembling pumps, also carries a complete inventory of all Marlow pumps as well as replacement parts. This fourth Marlow factory (the others are located in Ridgewood, N. J., Coalville, England, and St. Cloud, France), will permit fast delivery to all sections of the southwestern United States.



THIS Washerless COUPLING

has no equal for efficiency, durability and safety in every high or low pressure hose service . . . steam, water, gas, air, oil, hydraulic. Ground joint union between stem and spud provides leakproof, trouble-free seal. Furnished with super-strong, "Boss" Offset and Interlocking Clamp.

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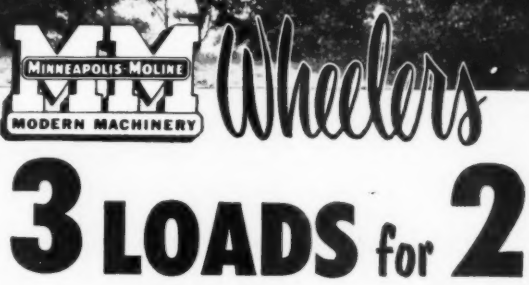
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- UTIL 6 speed shuttle gear.
- MM exclusive front wheels and axle design.
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It's what OWNERS SAY that counts!

*rubber-tired Tournadozer earns high praise
for performance on variety of jobs . . .*



Ivan Wright, Peoria, Illinois, stripped 40 ft. of overburden at coal mine near Glasford with this Tournadozer. After 2500 hours of work with rig, he reports, "There's not a crawler machine made that will move the amount of dirt Tournadozer will. Up to 50 miles, you can drive Tournadozer job-to-job as fast as you can move a crawler on a truck. You waste no time loading, blocking."



Minneapolis Contractor Carl Bolander & Sons' Tournadozer pays off year around. In summer, it push-loads Tournapulls and dozes dirt . . . in winter, it plows snow. Says IVER BOLANDER of job shown, "This is one of the toughest clearing jobs New Market Township has ever had. The March snow was the heaviest in years . . . yet our Tournadozer did the work where other units failed."



Texas Contractor Martin Goebel worked this "C" 950 hours in 9 weeks, digging stockponds. Rig moved 125,000 yds. of sand and clay, an average of 131 pay yds. hourly over all dozing cycles. "Tournadozer is a contractor's dream," says Goebel. "You just can't believe what it will do until you try it on a job. After using the Tournadozer, I wouldn't have a crawler-tractor for our work."



At its Ohio plant, Diamond Portland Cement Co. strips shale year 'round with this C Tournadozer. For plant clean-up, rig runs 3 mi. from pit over asphalt roads in a few minutes . . . also handles shovel clean-up, snowplowing, etc. "Will move as much shale in 1/2 day as our crawler can in a full day. It sure has saved us a lot of money in moving costs," says Vice Pres. E. R. EVANS.



Lackey & Williams, Nacogdoches, Texas, used their 186 h.p. Tournadozer to stockpile a total of 1000 cu. yds. of road material. On 40-ft. one-way passes the Tournadozer piled 400 cu. yds. of clay and gravel in 5 hours. "This is the best piece of dirtmoving equipment I have ever operated. It is faster, has more power, and is easier to operate," reports Partner N. H. LACKEY.



Sugden & Sivier, Michigan, used C Tournadozer to backfill 19,500 yds. of material into 10 and 11-ft. trenches for Detroit city water mains. Despite traffic, the rig averaged 360 cubic yds. per day. Its big low-pressure, 21.00 x 25 tires prevented damage to pavement. On 5 jobs (3000 hours) "C" was 95% mechanically efficient. "Cuts backfill costs 50%," says Partner GRANT SIVIER.



Leveling spoil, clearing snow, and handling pit clean-up for West Virginia-Pittsburgh Coal Company mine at Collier, West Virginia, Tournadozer drew high praise from Owner F. A. HOWE. "It dozes 50% more spoil than a crawler, and is so fast and mobile that we use it to work all 5 of our pits. It saves us 1 to 2 tractors. It does a good job any place we put it."

See us for more information on how modern Tournadozers can reduce costs and speed completion of your job. We'll also be glad to give you the names and addresses of owners who can tell you more about Tournadozer production advantages.

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